BRITISH GUIANA.
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SUGAR BULLETIN No. 5.

FIELD EXPERIMENTS WITH SUGAR CANE, V.

BY

C. HOLMAN B. WILLIAMS,
Sugar Agronomist,

R. R. FOLLETT-SMITH,
Chemist-Ecologist,

AND

C. CAMERON,
Field Manager.

IMPERIAL MYCOLOGICAL INSTITUTE
15 AUG. 1936

WITH

A PREFATORY NOTE

BY

PROFESSOR J. SYDNEY DASH,
Director of Agriculture.

THE "DAILY CHRONICLE," GEORGETOWN, DEMERARA,
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PREFATORY NOTE.

Sugar Bulletin No. 5 of the Department of Agriculture presents the results of investigations continued during the past year. There are two outstanding features of the Colony's major industry, during this period, which deserve more than passing mention : production and acre yields continue at record high levels while prices show no upward movement from correspondingly low levels.

It is during these periods of economic stress that the value of cumulative scientific effort may be very noticeable although the finding of ways and means for the continued prosecution of such work is often rendered most difficult. The sugar industry of British Guiana has for some years contributed directly to the maintenance of field research and investigations. It is now reaping the benefit of that policy, and it must be observed that but for the increased acre yields now being obtained the industry would be in a perilous condition.

Generally speaking, estate cultivations are, on the average, producing one ton sugar per acre more than they did a few years ago—an increase of approximately 50 per cent., by far the greater part of which may be attributed to field improvements. It is not intended to suggest that the whole of this large increase is due purely to the discoveries of research workers. The planters themselves have not only been quick to sense the utility of many of the recommendations made in regard to soil treatment, varieties, fertilisers, pest control, etc.—co-operating fully with the Department in this work—but have also, as a result of their own experience, adopted or extended field practices which have proved their merit. In this connection, there has been considerable development in the practice of flood-fallowing, referred to in previous publications, more systematic use of irrigation water where such has been available and, in some cases, improvements in field drainage.

During the past year, considerable light has been thrown on the mechanism of flood-fallowing, and it now seems certain that the outstanding effect is an improvement in soil texture—of paramount importance in the working of the stiff clays of the coastal belt. There should be no limitations to its use in future except those of available land and water. Additional information, too, has emerged from further studies of such factors as duration and depth of flooding.

It is not suggested, of course, that all the factors responsible for the yield increases noted operate to the same degree on all estates. For example, some estates have improved their drainage more than others, the change over from D. 625 to Diamond 10 and P.O.J. 2878 has been more rapid in some cases, while others again have substantially increased their dosage of sulphate of ammonia in accordance with the recommendations of the Department. Taking the Colony

as a whole, however, the two major factors in the increased yields obtained have been the extension of flood-fallowing and the greater use of sulphate of ammonia.

In the latter connection it is interesting to note that while the cane acreage has increased recently by about eight per cent. only, the importations of this fertiliser have risen from 6,691 tons in 1926 to 10,268 tons in 1935. In the next year or two, variety changes will exert a still greater influence as, with one or two exceptions, most estates will have adopted Diamond 10 or P.O.J. 2878 to the exclusion of the older canes. Given normal weather conditions, therefore, and no relaxation of effort in other directions, the acre yields should be fully maintained and even surpassed. Indeed, this is borne out by the results obtained during the Spring grinding just finished.

The arrangement of *Sugar Bulletin* No. 5 follows the general form of those which have previously appeared. It records the results of the work with varieties at the central station and the estates' sub-stations, results of trials with manures and lime-bearing materials, while it has been possible to deal with flood-fallowing trials more fully than hitherto. Although insignificant results have been obtained in numerons experiments with lime-bearing materials in the past this complicated problem cannot be considered as finally solved. Fresh light has been thrown on the subject as a result of experiments with small dressings of limestone applied just before flooding in comparison with applications just before planting. Increased yields by the former method have been obtained in the ratoon crops and, in order further to test this point, proposals have been made to the sugar estates leading to the adoption of a large scale experimental programme with the object of determining the issue from a practical and economic point of view.

It is pleasing to record the interest which is being exhibited on the part of estates' staffs in the work being prosecuted and, more recently, new ground has been broken by the inauguration, in co-operation with the Sugar Producers' Association, of organised field days for their special benefit. Two or more representatives from each estate in the Colony have attended at the central station and have had the opportunity of examining the methods of approach to the problems being investigated, of inspecting new and promising varieties and hearing short addresses on the various phases of the work in progress. In this way, that spirit of co-operation between the sugar industry and the Department, which has been steadily fostered, is likely to be still further strengthened.

J. SYDNEY DASH,
Director of Agriculture.

FIELD EXPERIMENTS WITH SUGAR CANE, V.

BY

C. HOLMAN B. WILLIAMS, *Sugar Agronomist*,

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INTRODUCTION.

The experiments described in this Bulletin were reaped during the year ended June 30, 1936. They comprise :—

36 Variety Trials,

25 Manurial Trials,

2 Flood-fallowing Trials,

and the Bulletin is divided into three main sections for the three groups.

Four similar Bulletins, reporting earlier phases of the work, have appeared previously. The first of the series contained a description of the methods used in carrying out the trials.

Weather conditions during the period were, on the whole, favourable to sugar production, and the general average yield of sugar on the estates was about three tons per acre.

The execution of trials on estates causes a considerable amount of inconvenience, and opportunity is here taken to thank the Managers and staffs for their very welcome co-operation.

VARIETY TRIALS.

The variety trials are described under three sub-sections, *viz.*, (a) plant cane trials, (b) ratoon trials, and (c) discussion and summary. It has been the custom to divide the ratoons into two sub-sections (*i.e.*, first and second ratoons),

but the floods of 1933-34 so upset the routine of laying down new trials that there are hardly enough ratoon trials reported here to necessitate sub-division. Hence the four first ratoon trials, ten second and one third, reaped during the period, are discussed in one sub-section.

In Appendix I will be found tables comparing the monthly rainfall recorded at each trial site during the progress of the experiments with the mean monthly rainfall experienced there during preceding years; the variations from the monthly normals are there indicated for each trial.

Soil and subsoil samples from the various sites have been examined in the laboratory. The results of the analyses will be found in Appendix II.

SUB-SECTION A.—PLANT CANE VARIETY TRIALS.

Plant Cane Variety Trials Reaped at Sophia Sugar Experiment Station.

Table I presents a list of the plant cane variety trials reaped at the Sophia Sugar Experiment Station during the period under review.

Table I.— **Plant Cane Variety Trials Reaped at Sophia Experiment Station.**

Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
		Planting.	Reaping.	Varieties.	Replicates.	
3 East A	16.75	18.IV.34	13.IX.35	10	5	Randomised Blocks.
3 „ B	16.75	18.IV.34	13.IX.35	10	5	„
5 „ A	12.75	10.IV.35	30.IV.36	5	5	Latin Square.
5 „ B	12.75	10.IV.35	30.IV.36	5	5	„
5 „ C	12.75	10.IV.35	30.IV.36	5	5	„
5 „ D	12.75	10.IV.35	30.IV.36	5	5	„
5 „ E	12.25	19.IV.35	30.IV.36	8	5	Randomised Blocks.
5 West	13.25	17. X .34	27.XI.35	6	5	„
7 „	12.50	18.XI.34	22.XI.35	7	5	„
8 „	13.00	31. X .34	28.XI.35	14	5	„
9 „	12.00	30.XI.34	3.XII.35	9	9	Latin Square.
10 „	14.75	25. I .35	14.IV.36	10	10	„
12 „	14.75	17. I .35	6.IV.36	10	10	„

Sophia—Field 3 E.—Plant Canes.

The data from the two trials in Field 3 E., Sophia, are presented in Table II and Figures I and II.

TABLE II.—**Results of 2 Variety Trials in Field 3 East, Sophia.**

PLANTS, 16.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
				Experiment A.			
MEAN YIELDS:	D. 219/30	47.21	11.62	8.41	87.0	5.50	123.87
	D. 52/20	39.21	13.08	6.10	89.0	5.12	115.32
	D. 64/30	37.34	12.62	9.36	87.0	4.71	106.08
	D. 134/27	42.95	10.55	11.09	83.7	4.52	101.80
	D. 62/30	31.85	13.57	5.37	89.6	4.33	97.52
	D. 625	36.58	11.52	13.36	83.1	4.21	94.82
	B. 417	34.64	12.06	7.35	88.3	4.18	94.14
	B. 726	31.66	12.64	8.46	86.8	4.01	90.32
	D. 30/28	37.52	10.66	9.59	84.0	3.99	89.86
	B. 755	32.14	11.96	9.01	86.0	3.84	86.49
	Mean:					4.44	100.00
	Standard Error:					0.34	7.66
	Significant Difference, 20: 1:					0.98	22.07
				Experiment B.			
MEAN YIELDS:	D. 69/29	51.62	11.48	8.06	85.5	5.93	132.07
	D. 625	40.76	12.60	9.33	85.9	5.12	114.03
	D. 18/29	45.30	11.05	6.91	84.5	5.04	112.25
	D. 178/29	36.04	13.85	5.50	88.3	5.01	111.58
	D. 140/29	43.54	11.47	9.66	84.5	5.01	111.58
	D. 76/29	33.49	12.03	7.60	86.0	4.03	89.75
	D. 184/29	35.24	11.29	8.90	85.0	3.98	88.64
	D. 2/29	31.93	11.71	10.31	84.1	3.69	82.18
	D. 16/29	37.60	9.80	15.69	80.9	3.69	82.18
	D. 180/29	31.50	10.74	9.33	83.3	3.38	75.28
	Mean:					4.49	100.00
	Standard Error:					0.33	7.35
	Significant Difference, 20: 1:					0.95	21.16

Reaping of this Field had, unavoidably, to be postponed until the canes were over-mature. In consequence there was a great deal of decaying cane to be discarded when the plots were eventually taken off.

In Experiment A, D. 219/30 (parents: D. 625 x S.C. 12/4) and D. 52/20 (parent: D. 625) were outstanding. D. 219/30 was not so satisfactory in Field

10 W., Sophia, where the yield from all varieties was very poor. D. 52/20 has before given a good account of itself but in Field 5 E. it was unsatisfactory. In Field 9 W., Sophia, where it was apparently immature when reaped, it yielded six per cent. less sucrose per acre as a plant cane than did D. 625.

As plant canes in this trial the Barbados canes were disappointing.

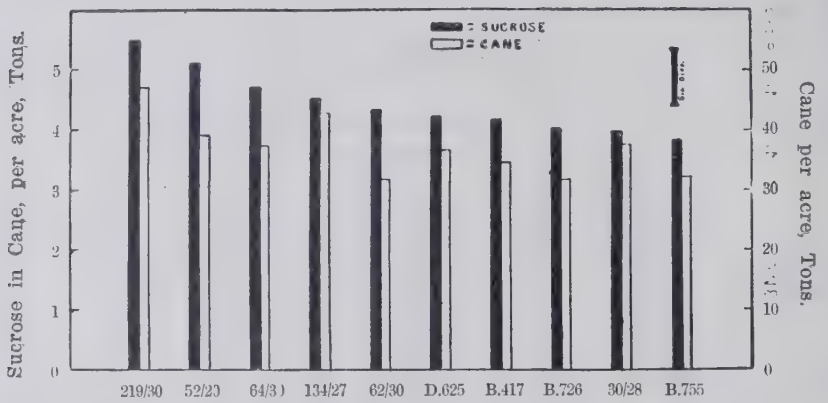

FIG. I.

Sucrose and Cane Yields from Field 3 E., (A), Sophia (Plant Canes).

In Experiment B, the only cane to outyield D. 625 as a plant was D. 69/29 (parents: S.C. 12/4 x D. 625) which gave a heavy tonnage but mediocre juice. D. 18/29 (parent: D. 118) came close after D. 625 with D. 178/29 (parents: D. 625 x B.H. 10/12) and D. 140/29 (parents: S.C. 12/4 x D. 625) not far behind. D. 178/29 appears to be a cane that can retain its juice qualities for a long time.

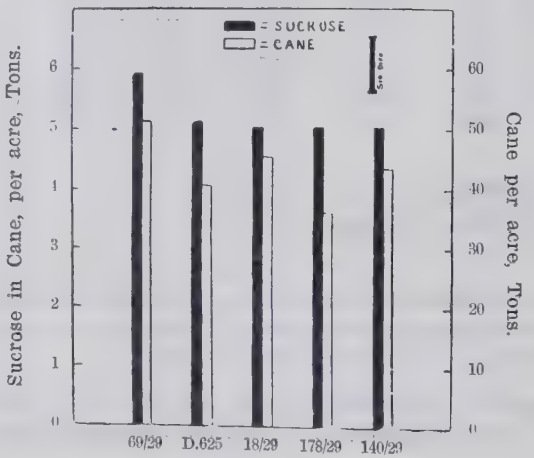

FIG. II.

Sucrose and Cane Yields from Field 3 E., (B), Sophia (Plant Canes).

The total rainfall on these trials was almost 21 in. below the average. Of the first nine months of the growing period, only two had satisfactory rainfalls.

The topsoil of Field No. 3 E., Sophia, is a markedly acidic heavy silt overlying a slightly acidic clay. Both topsoil and subsoil contain average amounts of organic matter with a normal carbon : nitrogen ratio. Both topsoil and subsoil are fairly saline. The theoretical lime requirement of the topsoil is below the average, that of the subsoil normal.

Sophia—Field 5 E.—Plant Canes.

Five variety trials were reaped in Field 5 E., Sophia, as plants. The results are shown in Tables III and IV, and Figures III to VII.

TABLE III.—Results of 4 Variety Trials in Field 5 East, Sophia.

PLANTS, 12.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
				Experiment A.			
MEAN YIELDS:	B. 755	31.00	13.55	3.11	89.4	4.22	111.05
	<> 10	30.90	13.57	3.37	88.3	4.19	110.26
	D. 628/21	29.73	12.67	8.23	85.5	3.75	98.68
	D. 747/13	29.60	12.46	6.13	87.5	3.69	97.11
	B. 726	23.88	13.15	4.13	89.8	3.13	82.37
	Mean:					3.80	100.00
	Standard Error:					—	—
	Significant Difference, 20: 1:					—	—
				Experiment B.			
MEAN YIELDS:	<> 10	32.03	13.46	4.48	87.8	4.32	121.35
	D. 47/30	30.24	12.11	4.34	87.1	3.65	102.53
	D. 75/29	28.80	12.56	4.44	86.5	3.61	101.40
	D. 284/27	28.32	11.67	8.43	84.1	3.29	92.42
	D. 163/29	27.39	10.62	6.92	82.3	2.91	81.74
	Mean:					3.56	100.00
	Standard Error:					0.18	5.06
	Significant Difference, 20: 1:					0.55	15.45
				Experiment C.			
MEAN YIELDS:	<> 10	34.38	13.56	4.10	88.2	4.68	126.49
	D. 183/29	29.41	13.46	6.51	88.0	3.96	107.03
	D. 24/30	31.10	12.40	5.71	84.5	3.86	104.32
	D. 426/21	24.95	13.10	5.50	86.0	3.26	88.11
	D. 13/30	23.11	11.99	5.01	87.1	2.75	74.32
	Mean:					3.70	100.00
	Standard Error:					0.22	5.95
	Significant Difference, 20: 1:					0.68	18.38
				Experiment D.			
MEAN YIELDS:	<> 10	34.34	14.05	4.39	88.2	4.85	123.41
	D. 18/29	31.10	12.23	4.67	87.5	3.80	96.69
	D. 2/30	29.40	12.63	4.10	86.9	3.72	94.66
	D. 7/30	29.88	12.23	3.95	86.6	3.66	93.13
	D. 76/29	26.85	13.52	5.18	87.5	3.63	92.37
	Mean:					3.93	100.00
	Standard Error:					—	—
	Significant Difference, 20: 1:					—	—

TABLE IV.—**Results of a Variety Trial in Field 5 East, Sophia.**

PLANTS, 12.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
			Experiment E.				
MEAN YIELDS:	P.O.J. 2878	33.49	14.00	3.22	89.2	4.69	135.94
	D. 241/21	30.31	12.50	5.09	87.4	3.79	109.86
	D. 195/17	27.16	13.36	4.42	87.1	3.64	105.51
	D. 49/30	27.39	13.18	3.60	89.1	3.61	104.64
	D. 57/27	27.04	11.24	9.35	82.0	3.05	88.41
	D. 52/20	22.93	13.12	4.78	88.3	3.00	86.96
	D. 155/30	25.19	11.70	5.48	87.4	2.95	85.51
	D. 60/30	23.84	12.08	4.25	87.0	2.88	83.48
	Mean:					3.45	100.00
	Standard Error:					0.22	6.38
	Significant Difference, 20 : 1 :					0.64	18.55

In experiments A to D the standard used was Diamond 10. In experiment E, P.O.J. 2878 was used as the standard. Since these two canes have proved better yielders than D. 625 it has been decided, wherever possible, to use them in future as standards in the varietal tests.

In experiment A, B. 755 gave approximately the same plant cane yield as did Diamond 10. This was surprising after its behaviour in Field 3 E. (Experiment A). B. 726, on the other hand, did even worse than in Field 3 E. D. 628/21 and D. 747/13 were inferior to Diamond 10.

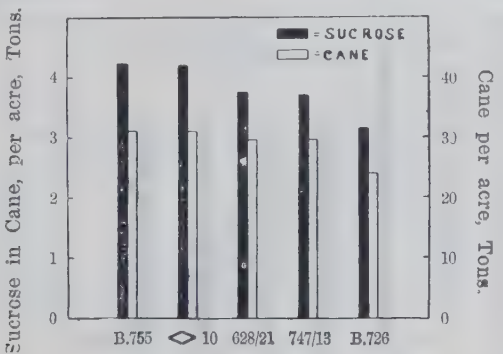

FIG. III.

Sucrose and Cane Yields from Field 5 E., (A), Sophia (Plant Canes).

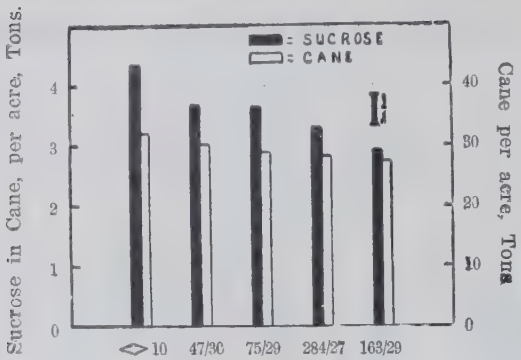

FIG. IV.

Sucrose and Cane Yields from Field 5 E., (B), Sophia (Plant Canes).

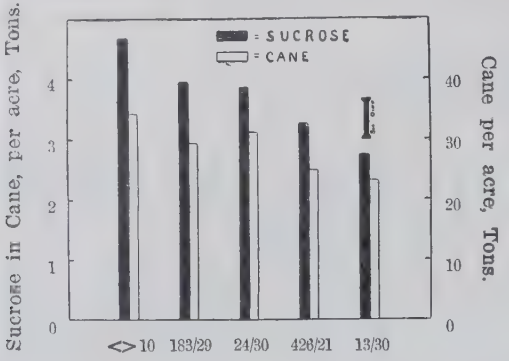

FIG. V.

Sucrose and Cane Yields from Field 5 E., (C), Sophia (Plant Canes).

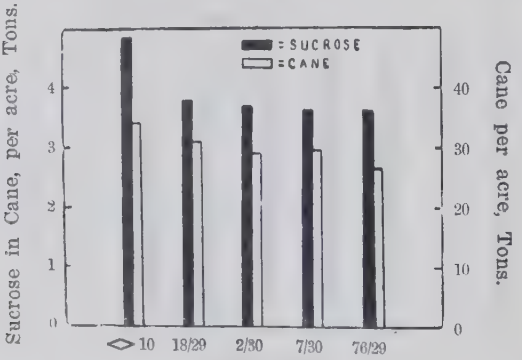

FIG. VI.

Sucrose and Cane Yields from Field 5 E., (D), Sophia (Plant Canes).

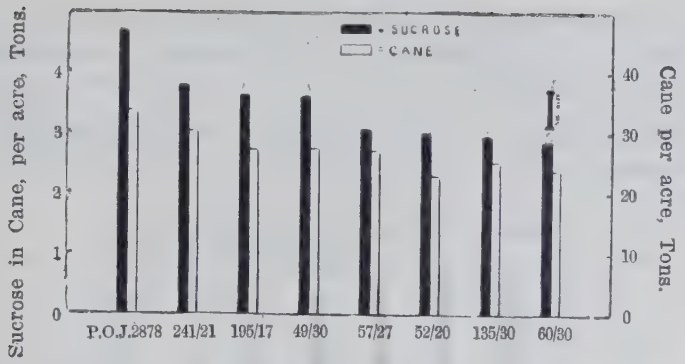

FIG. VII.

Sucrose and Cane Yields from Field 5 E., (E), Sophia (Plant Canes).

None of the canes in Experiments B, C or D gave yields comparable to that of Diamond 10; nor did any of those in experiment E approach that of P.O.J. 2878, the standard used in that trial.

The experiments in Field 5 E., Sophia, were fairly well watered in the early stages but rainfall was low fron the eighth to the eleventh month inclusive; it was abnormally high during the two months immediately preceding reaping.

The topsoil of Field 5 E., Sophia, is a markedly acidic clay overlying a slightly acidic clay subsoil. The organic matter content of both topsoil and subsoil is average. Both topsoil and subsoil are above the average salinity and possess low theoretical lime requirements.

Sophia—Field 5 W.—Plant Canes.

The plant cane results from the trial in Field 5 W., Sophia, are shown in Table V and Figure VIII.

TABLE V.—**Results of a Variety Trial in Field 5 West, Sophia.**

	PLANTS, 13.25 months.						
	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS:	D. 625	46.45	13.91	12.52	85.9	6.47	108.01
	P.O.J. 2878	43.20	14.78	5.96	87.9	6.40	106.84
	◇ 10	42.02	14.81	6.60	89.2	6.20	103.51
	D. 203/20	54.11	11.15	18.67	79.8	6.03	100.67
	D. 195/17	43.97	13.51	11.94	84.4	5.92	98.83
	G. 119	35.50	13.93	7.41	88.4	4.93	82.30
	Mean:					5.99	100.00
	Standard Error:					0.30	5.01
	Significant Difference, 20 : 1 :					0.88	14.69

Yields were very satisfactory in this trial. Rather unexpectedly, D. 625 has led both P.O.J, 2878 and Diamond 10 by slight margins. Its yield of cane was superior, its juice qualities inferior to those of the other two canes.

D. 203/20 gave by far the heaviest yield of cane but its juice was poor. G. 119 was disappointing.

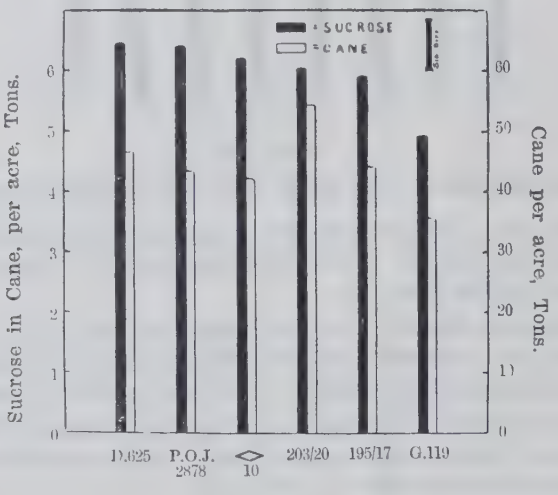

FIG. VIII.

Sucrose and Cane Yields from Field 5 W., Sophia (Plant Canes).

Although there was a total deficit of 4.09 in. of rain for the growing season, the trial in Field 5 W., Sophia, was, on the whole, well served with rainfall, for the shortages from the normal occurred, for the most part, in the wetter months.

The topsoil of Field 5 W., Sophia, is a slightly acidic clay overlying an alkaline clay subsoil. The organic matter content of the topsoil is normal and that of the subsoil is above the average. The topsoil possesses a normal amount of soluble salts but the subsoil is below the average salinity. The theoretical lime requirements are normal.

Sophia—Field 7 W.—Plant Canes.

Table VI and Figure IX record the results of the plant cane test in Field 7 W., Sophia.

TABLE VI.—**Results of a Variety Trial in Field 7 West, Sophia.**

	PLANTS, 12.50 months.						
	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS:	P.O.J.2878	34.60	14.45	5.95	88.4	4.99	117.41
	T. 1198	30.85	14.81	4.70	89.8	4.57	107.53
	D. 66/30	33.16	13.27	5.12	88.0	4.39	103.29
	D. 9/28	31.10	13.93	6.18	88.3	4.33	101.88
	D. 11/28	33.82	12.66	9.47	86.4	4.27	100.47
	D. 19/30	29 16	13.77	4.45	88.4	4.03	94.82
	P.R. 820	22.98	13.88	8.22	87.4	3.18	74.82
	Mean:					4.25	100.00
	Standard Error:					0.26	6.12
	Significant Difference, 20: 1:					0.76	17.88

P.O.J. 2878 heads the list with the best cane yield and the second best juice characteristics, T. 1198 (parent: M.P. 55), a Trinidad seedling imported in 1931, came second. This cane is rich in sucrose and yields a juice of high purity. D. 66/30 and D. 11/28 have both given satisfactory results in other trials. Their cane yields were among the best in this trial but P.O.J. 2878 and T. 1198 had better juices. P.R. 820, a 1931 importation from Puerto Rico, grew rapidly at first but stopped growing early, flowered and fell away badly by the time the trial was reaped.

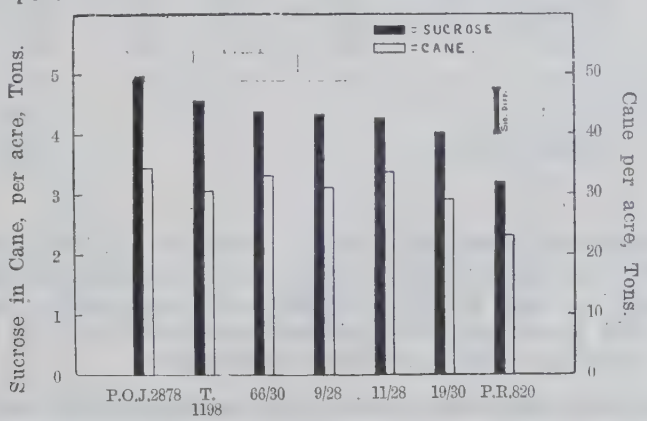

FIG. IX.

Sucrose and Cane Yields from Field 7 W., Sophia (Plant Canes).

Rainfall conditions experienced by this trial were similar to those just described for Field 5 W., Sophia.

The topsoil of Field 7 W., Sophia, is a slightly acidic heavy silt overlying an alkaline clay. The organic matter content of the topsoil is low and that of the subsoil normal. The carbon : nitrogen ratio of the topsoil is wide, that of the subsoil being normal. Both topsoil and subsoil are of low salinity. The theoretical lime requirements are of an average value.

Sophia—Field 8 W.—Plant Canes.

The results of the plant cane reaping of the trial in Field 8 W., Sophia, are given in Table VII and Figure X.

TABLE VII.— **Results of a Variety Trial in Field 8 West, Sophia.**

	PLANTS, 13.00 months.						
	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
EAN YIELDS :	D. 4/28	34.19	13.93	11.03	87.6	4.77	120.76
	<> 10	29.94	15.02	5.95	88.6	4.53	114.68
	P.O.J. 2878	29.43	14.85	5.76	88.3	4.47	113.16
	D. 895/22	31.79	13.27	7.25	88.3	4.20	106.33
	D. 11/24	30.49	13.18	7.47	87.2	4.11	104.05
	D. 548/21	31.44	12.89	10.72	86.7	4.03	102.03
	D. 682/20	29.20	13.72	9.52	86.8	4.01	101.52
	D. 23/28	24.51	15.50	5.08	89.9	3.83	96.96
	D. 1/28	26.65	14.12	7.98	87.1	3.77	95.44
	D. 10/28	25.63	14.52	6.77	88.1	3.75	94.94
	D. 625	27.49	13.63	11.79	84.8	3.72	94.18
	D. 154/28	25.60	13.70	5.34	87.9	3.51	88.86
	D. 573/22	24.21	13.82	6.68	87.3	3.37	85.32
	D. 50/28	26.71	12.03	12.77	83.5	3.19	80.76
	Mean :					3.95	100.00
	Standard Error :					0.29	7.34
	Significant Difference, 20 : 1 :					0.84	21.27

The average yield of the field was fair for Sophia. D. 4/28 (parents : S. C. 12/4 x D. 625), which heads the list, has been tested several times previously and only averaged 92 per cent. of the D. 625 yields in the same fields. Diamond 10 and P.O.J. 2878 give very similar yields and are well above D. 625. D. 895/22 (parent : D. 1452) seems worthy of further consideration.

A glance at this table indicates what a high percentage of the seedlings have better purities and glucose ratios than has D. 625 which never seems to ripen thoroughly.

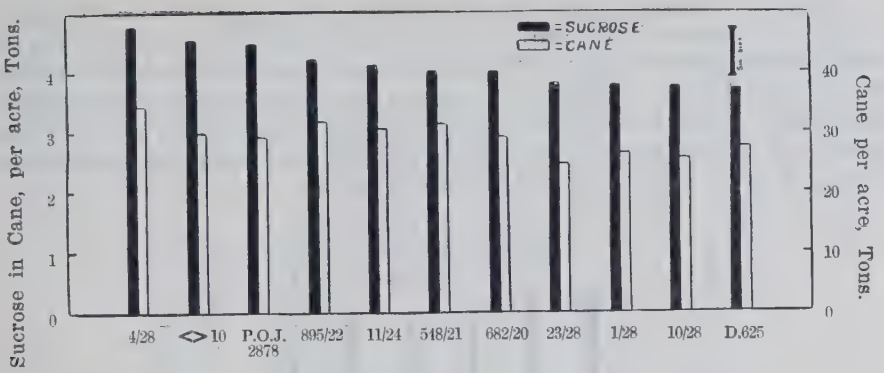

FIG. X.

Sucrose and Cane Yields from Field 8 W., Sophia (Plant Canes).

The rainfall conditions described for the trial in Field 5 W., Sophia, also prevailed for this experiment.

The topsoil of Field 8 W., Sophia, is an alkaline heavy silt overlying an alkaline clay subsoil. The organic matter content of the topsoil is low and that of the subsoil normal. The carbon : nitrogen ratio of the topsoil is of an average value and that of the subsoil wide. The salinity of both topsoil and subsoil is low. The theoretical lime requirements are of an average value.

Sophia—Field 9 W.—Plant Canes.

The plant cane results from the experiment in Field 9 W., Sophia, will be found in the Table VIII and Figure XI.

TABLE VIII.—**Results of a Variety Trial in Field 9 West, Sophia.**

PLANTS, 12.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS :	D. 895/22	28.66	14.86	6.88	88.2	4.27	113.26
	G. 119	26.72	15.79	5.40	89.9	4.21	111.67
	D. 625	27·85	14.49	11.14	85.6	4.01	106.37
	P.O.J. 2878	25.27	15.14	6.19	88.2	3.83	101.59
	D. 548/21	28.89	13.31	9.83	85.8	3.83	101.59
	D. 52/20	26.21	14.51	10.53	85.7	3.80	100.80
	D. 92/17	24.65	14.42	7.99	86.7	3.56	94.43
	D. 573/22	20.71	15.66	6.56	88.4	3.25	86.21
	D. 218/30	22.36	14.39	7.93	87.6	3.20	84.88
	Mean :					3.77	100.00
	Standard Error :					0.18	4.77
	Significant Difference, 20 : 1 :					0.52	13.79

D. 895/22, which led D. 625 by 12 per cent. in the experiment just discussed, has led it here by 7 per cent. G. 119, with a remarkably good juice, has also outyielded the standard cane. On the other hand it proved inferior to D. 625 in Field 5 W., Sophia. In Field 15 A., O.L., Port Mourant, this variety gave, for three crops, the same total yield as D. 625. The last-named shows a five per cent. increase in sucrose per acre over P.O.J. 2878 which, however, had a much better juice. D. 52/20 was immature at the time of harvest.

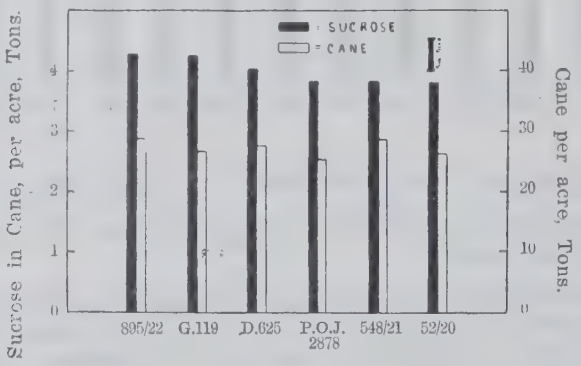

FIG. XI.

Sucrose and Cane Yields from Field 9 W., Sophia (Plant Canes).

During their growth, the canes in Field 9 W., Sophia, experienced 3.18 in less rainfall than might have been expected over the whole period. The deficits occurred mainly in the wetter months.

The topsoil of Field 9 W., Sophia, is a slightly acidic heavy silt overlying an alkaline heavy silt subsoil. The organic matter content of the topsoil is low and that of the subsoil is normal. The carbon : nitrogen ratios are normal. The salinity of the topsoil is high, that of the subsoil low. The theoretical lime requirements are normal.

Sophia—Field 10 W.—Plant Canes.

Table IX contains the plant cane data from the trial in Field 10 W., Sophia.

TABLE IX.— **Results of a Variety Trial in Field 10 West, Sophia.**

PLANTS; *At first Sampling, 11.75 months;* At Reaping, 14.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, Mean.
MEAN YIELDS:	D. 625	16.07	*13.89* 14.78	*9.72* 7.08	*85.3* 86.9	2.37	124.74
	D. 24/30	14.88	*13.80* 14.78	*7.15* 4.03	*85.7* 87.9	2.21	116.32
	D. 219/30	15.94	*12.99* 13.40	*8.12* 4.95	*84.5* 88.3	2.14	112.63
	D. 178/30	13.44	*14.98* 15.70	*5.00* 3.44	*89.0* 90.6	2.13	112.11
	D. 74/30	13.33	*13.50* 15.13	*7.15* 3.79	*85.3* 89.0	2.02	106.32
	D. 64/30	12.00	*14.89* 15.37	*4.20* 3.55	*88.1* 89.6	1.85	97.37
	D. 136/30	13.71	*11.76* 13.01	*9.83* 4.72	*83.8* 87.6	1.79	94.21
	D. 7/30	12.00	*13.39* 14.36	*5.52* 4.08	*85.7* 87.4	1.73	91.05
	D. 215/30	11.12	*14.03* 14.50	*5.08* 3.67	*86.9* 88.3	1.61	84.74
	D. 6/30	7.68	*13.57* 14.37	*5.54* 4.19	*86.9* 88.6	1.10	57.89
	Mean:					1.90	100.00
	Standard Error:					0.12	6.32
	Significant Difference, 20: 1:					0.35	18.42

Yields were very poor and, as will be seen, D. 625 outyielded all competitors. D. 24/30 has been tried elsewhere and does not appear worthy of further attention. D. 219/30 was rather disappointing after its performance in Field 3 E., Sophia. The remaining canes on the list will be discarded.

The two lots of analytical figures indicate that, in general, considerable ripening and improvement in juice may take place between 11.75 and 14.5 months.

Rainfall on this trial was deficient from the tenth to the thirteenth months, inclusive, and then excessive in the two months prior to reaping.

The topsoil of Field 10 W., Sophia, is a markedly acidic heavy silt overlying an alkaline heavy silt subsoil. The organic matter content of the topsoil is low and that of the subsoil normal. The carbon : nitrogen ratio of the topsoil is of

average value and that of the subsoil narrow. The salinity of the topsoil is high, that of the subsoil being normal. The theoretical lime requirement of the topsoil is low, that of the subsoil of average value.

Sophia—Field 12 W.—Plant Canes.

The plant cane results from Field 12 W., Sophia, are given in Table X.

TABLE X.—**Results of a Variety Trial in Field 12 West, Sophia.**

PLANTS; *At first Sampling, 11.75 months;* At Reaping, 14.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.	
						Tons.	% Mean.
MEAN YIELDS:	D. 625	28.93	*13.91* 15.12	*12.37* 9.75	*83.8* 86.9	4.37	135.29
	D. 134/27	31.31	*11.62* 12.74	*7.94* 4.91	*83.7* 86.5	3.99	123.53
	D. 51/30	23.95	*13.29* 15.11	*8.86* 5.61	*85.2* 89.3	3.61	111.76
	D. 2/29	23.65	*14.23* 15.22	*6.60* 4.75	*87.7* 89.7	3.59	111.15
	D. 47/30	20.56	*13.92* 15.43	*7.74* 3.88	*86.8* 89.1	3.17	98.14
	D. 2/30	20.58	*13.38* 15.23	*8.59* 3.90	*84.8* 88.7	3.14	97.21
	D. 38/30	20.10	*14.21* 14.85	*6.54* 3.99	*87.6* 89.8	3.00	92.88
	D. 13/30	18.17	*14.15* 15.43	*5.18* 3.09	*88.6* 91.0	2.80	86.69
	D. 63/30	17.23	*15.54* 16.17	*4.25* 3.39	*88.9* 90.8	2.79	86.38
	D. 46/30	13.51	*12.49* 13.44	*7.37* 6.48	*85.1* 86.4	1.82	56.35
	Mean:					3.23	100.00
	Standard Error:					0.17	5.26
	Significant Difference, 20 : 1 :					0.49	15.17

D. 625 outyielded all other varieties and only D. 134/27 seems worthy of further attention. This cane (parent: D. 617) outyielded D. 625 by 7 per cent. as a plant cane in Field 3 E., Sophia. It is a heavy cane yielding mediocre juice which is rather better at 14.75 than at 11.75 or 16.75 months. In this trial too duplicate analytical results are all in favour of later reaping.

The rainfall on Field 12 W., Sophia, was low from the eleventh to the fourteenth month of growth, inclusive. It was excessive during the month immediately preceding harvest.

The topsoil of Field 12 W., Sophia, is a markedly acidic heavy silt overlying an alkaline clay subsoil. The organic matter content of the topsoil is low and

that of the subsoil above the average. The carbon : nitrogen ratios are normal. The salinity of the topsoil is above the average that of the subsoil being below normal. The theoretical lime requirement of the topsoil is low, that of the subsoil normal.

Plant Cane Variety Trials Reaped in Berbice.

Two plant cane variety trials were reaped in Berbice during the period. Particulars as to their layout, etc., are given in Table XI.

Table XI.— **Plant Cane Variety Trials Reaped in Berbice.**

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Planting.	Reaping.	Varieties.	Replicates.	
Port Mourant	11 T.L.	12.50	10. X.34	23.X.35	9	6	Randomised Blocks.
Blairmont	24 Rp.	13.00	16.XI.34	19.XII.35	6	6	Latin Square.

Pln. Port Mourant—Field 11 T.L.—Plant Canes.

Table XII and Figure XII present the plant cane results from the experiment in Field 11 T.L., Pln. Port Mourant.

Table XII.— **Results of a Variety Trial in Field 11 T.L., Port Mourant.**

Plants, 12.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
Mean Yields :	D. 11/28	51.27	13.01	9 26	85.7	6.68	117.61
	P.O.J. 2878	48.98	13.41	8.82	84.9	6.54	115.14
	D. 4/28	44.43	14.02	10.49	86.1	6.17	108.63
	◇ 10	44.60	13.76	8.69	86.4	6.13	107.92
	D. 309/21	42.17	13.91	9.48	85.2	5.88	103.52
	D. 625	46.25	12.11	16.15	80.9	5.60	98.59
	D. 628/21	43.57	12.78	16.10	82.3	5.59	98.42
	G. 119	34.47	13.27	8.63	85.9	4.56	80.28
	D. 241/21	30.82	12.79	8.56	85.2	3.93	69.19
	Mean :					5 68	100.00
	Standard Error :					0.41	7.22
	Significant Difference, 20 : 1 :					1.18	20.77

D.11/28 which heads the list, has done so in several other trials. Estates have been advised to try it commercially. D. 4/28 has done well here, and in Field 8 W., Sophia. Its previous record had been only fair. It will be watched further. D. 309/21 and D. 628/21 have both beaten D. 625 over three crops in Field 28 A. E., Port Mourant. Both D. 625 and D. 628/21 showed high glucose ratios and low purities, indicating that they were reaped too early.

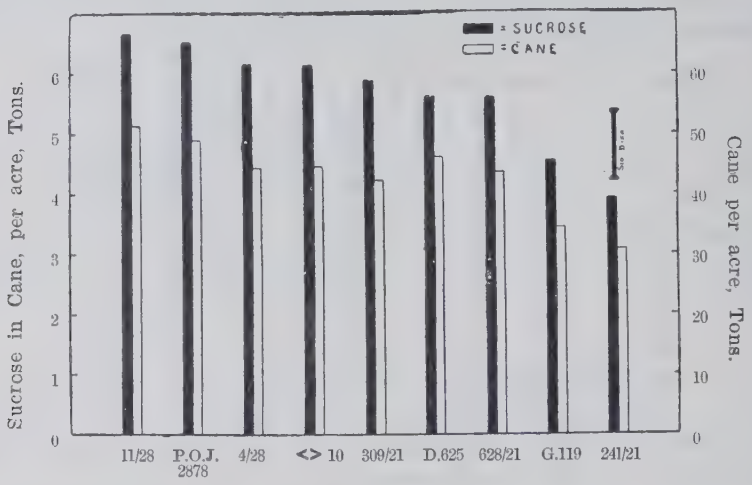

FIG. XII.

Sucrose and Cane Yields from Field 11 T.L., Port Mourant (Plant Canes).

This trial in Field 11 T.L., Port Mourant, received 16 in. more rain than might have been expected. Rainfall was short during the third, fourth, sixth and seventh months but high during the last six months of the growing period.

The topsoil of Field 11 T.L., Pln. Port Mourant, is a markedly acidic clay overlying a similar subsoil. Both topsoil and subsoil are well supplied with organic matter of normal carbon : nitrogen ratio. The salinity of the topsoil is above the average, that of the subsoil is normal. The theoretical lime requirements of both topsoil and subsoil are above the average.

Pln. Blairmont—Field 24 Rp.—Plant Canes.

The results of the plant canes reaped in Field 24 Rp., Blairmont, appear in Table XIII and Figure XIII.

TABLE XIII.— **Results of a Variety Trial in Field 24 Rp., Blairmont.**

PLANTS, 13.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.	
						Tons.	% Mean.
MEAN YIELDS:	◇ 10	51.81	13.79	8.72	87.2	7.15	106.40
	D. 927/22	61.75	11.42	13.68	82.3	7.06	105.06
	P.O.J. 2878	50.55	13.61	7.74	87.7	6.87	102.23
	D. 625	54.52	12.46	14.85	82.8	6.79	101.04
	D. 11/28	50.12	13.33	10.10	85.6	6.66	99.11
	D. 1/28	45.14	12.82	9.34	85.9	5.79	86.16
	Mean:					6.72	100.00
	Standard Error:					0.23	3.42
	Significant Difference, 20: 1:					0.68	10.12

The general yield of the field was high, with D. 927/22 averaging well over 60 tons of cane per acre. It is interesting to note the effect of the better sucrose content of Diamond 10 and P.O.J. 2878 which gave, respectively, ten and eleven tons of cane per acre less than D. 927/22 but yielded approximately the same amount of sucrose per acre. All the varieties except D. 1/28 will have to be watched as ratoons. D. 1/28 has failed several times and does not seem worthy of further attention.

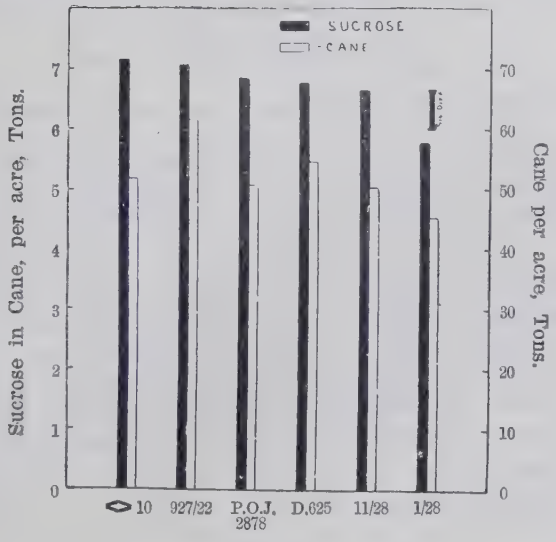

FIG. XIII.

Sucrose and Cane Yields from Field 24 Rp., Blairmont (Plant Canes).

The rainfall experienced by this trial totalled 6.49 inches above the normal. Deficiencies occurred mainly in the early and the last two months of growth. Precipitation was high during the third and from the seventh to the eleventh months, inclusive.

The topsoil of Field 24 Rp., Blairmont, is a markedly acidic clay overlying a similar subsoil. Both topsoil and subsoil are well supplied with organic matter of wide carbon : nitrogen ratio. The salinity of the topsoil is normal, that of the subsoil below the average. The theoretical lime requirements are above the average.

Plant Cane Variety Trials Reaped in East Demerara.

Particulars as to the layout, etc., of the four plant cane experiments reaped in East Demerara are recorded in Table XIV.

TABLE XIV.— **Plant Cane Variety Trials, Reaped in East Demerara.**

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Planting.	Reaping.	Varieties.	Replicates.	
Cane Grove	17 P.	13.75	14.II.35	8.IV.36	7	7	Latin Square.
Enmore	15 B.A.	14.00	13.II.35	15.IV.36	7	7	,,
Lusignan	40 W.	13.25	10. I .35	18. II.36	7	7	,,
La Bonne Intention	36 L.R.	14.50	1.II.35	15.IV.36	7	7	,,

Pln. Cane Grove—Field 17 P.—Plant Canes.

The results of the experiment in Field 17 P., Cane Grove, are presented in Table XV and Fig. XIV.

TABLE XV.— **Results of a Variety Trial in Field 17 P., Cane Grove.**

PLANTS ; *At first Sampling, 11.50 months ;* At Reaping, 13.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS :	D. 50/30	39.12	*13.37* 13.41	*11.03* 5.47	*87.1* 89.3	5.24	141.62
	D. 625	39.59	*11.19* 11.12	*22.60* 16.10	*73.6* 81.0	4.40	118.92
	D. 47/30	33.46	*12.78* 12.54	*12.81* 8.28	*83.7* 87.7	4.20	113.51
	D. 10/30	28.88	*12.80* 12.77	*11.38* 6.87	*85.0* 87.1	3.68	99.46
	D. 2/30	27.42	*11.23* 11.50	*15.04* 9.53	*81.8* 83.9	3.16	85.41
	D. 13/30	21.52	*11.34* 12.10	*13.23* 6.74	*83.4* 87.1	2.61	70.54
	D. 7/30	24.73	*11.34* 10.57	*16.31* 11.36	*81.5* 82.5	2.61	70.54
	Mean :					3.70	100.00
	Standard Error :					0.18	4.86
	Significant Difference, 20 : 1 :					0.52	14.05

The outstanding variety here is D. 50/30 (Parents : D. 625 x S.C. 12/4) which has given over 22 per cent. more sucrose than D. 625. The yield of cane from the two varieties was the same but D. 50/30 had a much better sucrose content and juice purity, and a lower glucose ratio than had D. 625. On a pegassy soil, at Pln. Wales, D. 50/30 gave about a ton less cane per acre than D. 625, but its superior juice enabled it to give a higher yield of sucrose per acre than that given by the latter variety. D. 50/30 is a stout cane.

With the object of securing some information as to which varieties are early and which late-maturing, this experiment was sampled two and a quarter months before the actual date of reaping and again at reaping. The analyses of the earlier samples are recorded in italics. It will be noted that at 11.5 months D. 50/30 had decidedly better juice characteristics than had D. 625 either then or at 13.75 months.

The remaining canes on the list appear to be inferior and will not receive further attention.

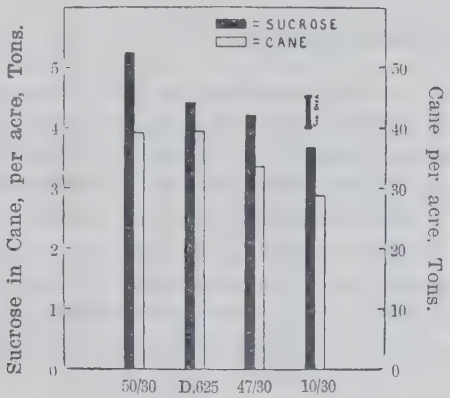

FIG. XIV.

Sucrose and Cane Yields from Field 17 P., Cane Grove (Plant Canes).

Rainfall was ample during the first but short from the second to the fourth months of the growing period. Then for six months it was ample, but again subnormal from the eleventh to the thirteenth months ; it was unusually high during the last month.

The topsoil of Field 17 P., Cane Grove, is a highly acidic pegassy clay overlying a highly acidic clay. Both topsoil and subsoil are well supplied with organic matter, that of the topsoil possessing a carbon : nitrogen ratio narrower than usual, while that of the subsoil is wider than the average. The salinity of both topsoil and subsoil is below the average. The theoretical lime requirement of the topsoil is of average value, that of the subsoil above normal.

Pln. Enmore—Field 15 B.A.—Plant Canes.

The results of the trial in Field 15 B.A., Pln. Enmore, are presented in Table XVI and Figure XV.

TABLE XVI.— **Results of a Variety Trial in Field 15 B.A., Enmore.**

PLANTS, 14.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS:	D. 927/22	47.06	12.01	9.31	84.4	5.65	134.52
	P.O.J. 2878	37.89	14.05	5.52	89.0	5.32	126.67
	<> 10	36.18	13.79	5.09	89.2	4.98	118.57
	D. 625	34.72	12.29	10.97	83.7	4.29	102.14
	D. 218/30	32.73	11.78	7.09	86.6	3.85	91.67
	D. 7/30	25.92	10.89	7.55	86.1	2.81	66.90
	D. 48/30	21.87	11.31	8.01	86.4	2.48	59.05
	Mean:					4.20	100.00
	Standard Error:					0.22	5.24
	Significant Difference, 20: 1:					0.64	15.24

D. 927/22 (parent: D. 4399) heads the list with a much heavier tonnage of cane than the other varieties in the trial and a juice approximating that of D. 625. As a plant cane in Field 24 Rp., Blairmont this cane also gave ten tons of cane more per acre than any other cane present. On lighter soil at Pln. Diamond it has outyielded Diamond 10 by a quarter of a ton of sugar over three crops.

D. 625 has been markedly outyielded by both P.O.J. 2878 and Diamond 10, the Java cane proving superior to the last-named. Attention may be drawn to the good juice characteristics of P.O.J. 2878 and Diamond 10.

The last three canes on the list will not receive any further attention.

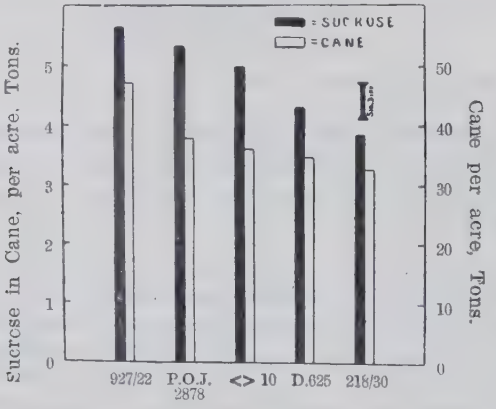

FIG. XV.

Sucrose and Cane Yields from Field 15 B.A., Enmore (Plant Canes).

Except during April 1935, rainfall on this experiment was satisfactory for the first ten months of growth. There then followed three months of low precipitation, while during the last month, March 1936, rainfall was unusually high.

The topsoil of Field 15 B.A., Pln. Enmore, is a highly acidic clay overlying a similar subsoil. Both topsoil and subsoil are well supplied with organic matter of wide carbon : nitrogen ratio. The salinity of both topsoil and subsoil is low. The theoretical lime requirements are above the average.

Pln. Lusignan—Field 40 W.—Plant Canes.

The returns from the trial in Field 40 W., Pln. Lusignan, are shown in Table XVII and Figure XVI.

TABLE XVII.— **Results of a Variety Trial in Field 40 W., Lusignan.**

PLANTS ; *At first Sampling, 11.25 months ;* At Reaping, 13.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS :	D. 49/30	29.58	*13.66* 14.60	*5.26* 4.21	*89.1* 89.7	4.31	116.17
	D. 182/30	32.28	*12.20* 12.46	*10.73* 9.15	*85.5* 84.9	4.01	108.09
	D. 625	27.92	*12.41* 13.74	*16.40* 10.88	*81.9* 85.3	3.84	103.50
	D. 47/30	25.73	*12.52* 14.14	*10.48* 8.10	*85.0* 86.4	3.63	97.84
	D. 154/28	26.93	*13.28* 13.40	*6.62* 4.73	*86.6* 85.6	3.61	97.30
	D. 218/30	28.26	*11.66* 12.33	*12.14* 8.62	*84.4* 85.2	3.49	94.07
	D. 7/30	23.31	*12.13* 13.21	*8.82* 5.77	*84.9* 85.5	3.08	83.02
	Mean :					3.71	100.00
	Standard Error :					0.13	3.50
	Significant Difference, 20 : 1 :					0.38	10.24

D. 49/30 has outyielded its parent (D. 625) by 12 per cent. The increase is due to better tonnage and higher sucrose content. In its first trial at Sophia this seedling surpassed D. 625 by a wide margin, a performance it has repeated in a trial on poor pegasse soil at Uitvlugt recorded in this Bulletin. Three plant cane results from this variety were therefore very promising. No ratoon data are as yet available.

D. 182/30 (parents : B. 6835 x D.625) came second in yield of sucrose per acre and first in yield of cane. It promises to be good agriculturally but less satisfactory from a factory standpoint.

Here too the experiment was sampled on two occasions with a view of learning something about the maturing characteristics of the varieties. It will be seen that most of the varieties show a marked drop in glucose ratio and a slight rise in sucrose content and purity at 13.25 months as compared with two months earlier. D. 49/30 showed better quality at 11.25 months than did D. 625 then or two months later.

The four varieties at the bottom of the list will be discarded.

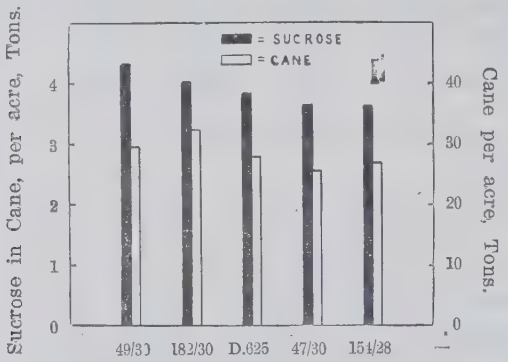

FIG. XVI.

Sucrose and Cane Yields from Field 40 W., Lusignan (Plant Canes).

Rainfall on this trial was below normal principally in the first, third, fourth, twelfth and thirteenth months of growth. The total deficiency over the whole growing period was, however, only 6.64 in.

The topsoil of Field 40 W., Lusignan, is a highly acidic fine silt overlying a highly acidic clay. The organic matter content of the topsoil is above the average, that of the subsoil below. The carbon : nitrogen ratio of the topsoil is wide, that of the subsoil narrower than the average. The salinity of the topsoil is below normal, that of the subsoil being above the average. The theoretical lime requirement of the topsoil is above the average, while that of the subsoil is below normal.

Pln. La Bonne Intention—Field 36 L.R.—Plant Canes.

Table XVIII and Figure XVII record the results of the experiment in Field 36 L.R., Pln. La Bonne Intention.

TABLE XVIII.— **Results of a Variety Trial in Field 36 L.R., La Bonne Intention.**

PLANTS, 14.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS:	D. 625	38.31	14 07	7.21	87.1	5.39	124.48
	D. 182/30	37.25	13.51	4.22	87.6	5.03	116.17
	D. 11/28	35.34	13.82	4.18	88.4	4.88	112.70
	D. 218/30	33.87	14.03	2 93	88.9	4.76	109.93
	D. 62/30	25.76	15.08	2.60	90.9	3.87	89.38
	D. 48/30	27.40	13.97	3.26	89.7	3.82	88.22
	D. 46/30	21.41	11.92	6.38	85.5	2.55	58.89
	Mean:					4.33	100.00
	Standard Error:					0.14	3.23
	Significant Difference, 20: 1:					0.40	9.24

D. 625 heads the list with a satisfactory yield and, for this variety, rather good juice. D. 182/30, which came second, is deserving of further trial. It outyielded D. 625 in a test at Pln. Lusignan and appears to be a vigorous grower. D. 11/28 has not done as well as usual but several other experiments as well as observations in the nurseries point to this being a useful variety. The four varieties at the bottom of the list will be discarded.

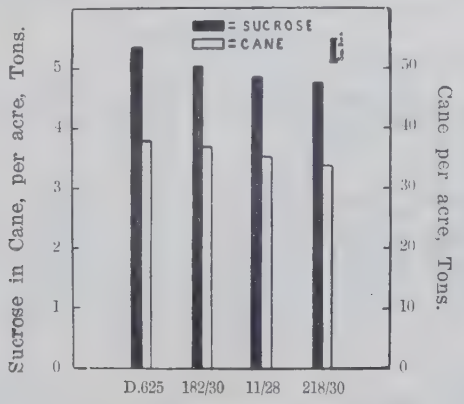

FIG. XVII.

Sucrose and Cane Yields from Field 36 L.R., La Bonne Intention (Plant Canes).

This test received a total of 3·93 in. of rain in excess of the average. Deficits were recorded mainly in the third, sixth and tenth to thirteenth months of growth ; excesses in the first, fourteenth and fifteenth.

The topsoil of Field 36 L.R., Pln. La Bonne Intention, is a markedly acidic heavy silt overlying a slightly acidic heavy silt. Both topsoil and subsoil are well supplied with organic matter of normal carbon : nitrogen ratio. The salinity of both topsoil and subsoil is high. The theoretical lime requirement of the topsoil is normal, that of the subsoil above the average.

Plant Cane Variety Trials Reaped in West Demerara.

Table XIX gives the particulars as to layout, etc., of the two plant cane experiments reaped in West Demerara.

TABLE XIX.— **Plant Cane Variety Trials Reaped in West Demerara.**

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Planting.	Reaping.	Varieties.	Replicates.	
Wales	45 B.	13.25	18.II.35	27.III.36	7	7	Latin Square.
Uitvlugt	42 W.	14.00	17. I .35	20.III.36	7	7	„

Pln. Wales—Field 45 B.—Plant Canes.

The data from the trial in Field 45 B., Pln. Wales, are given in Table XX and Figure XVIII.

TABLE XX.— **Results of a Variety Trial in Field 45 B., Wales.**

PLANTS, 13.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS :	D. 50/30	16.61	12.84	10.25	86.2	2.11	118.54
	D. 625	17.52	11.69	18.10	80.9	2.06	115.73
	D. 83/17	16.60	11.04	20.28	77.9	1.84	103.37
	D. 218/30	16.01	11.35	16.40	80.5	1.83	102.81
	D. 60/30	13.87	12.32	11.35	85.8	1.71	96.07
	D. 2/30	14.10	11.68	14.45	81.8	1.64	92.13
	D. 24/30	10.66	11.92	13.92	81.3	1.27	71.35
	Mean :					1.78	100.00
	Standard Error :					0.15	8.43
	Significant Difference, 20 : 1 :					0.43	24.16

Yields on this pegassy soil were poor and glucose ratios indicate that the canes were immature at reaping. When compared with D. 625 as a standard, the only variety deserving of further attention is D. 50/30 (parents: D. 625 x S.C. 12/4) which also outyielded D. 625 in a trial at Pln. Cane Grove.

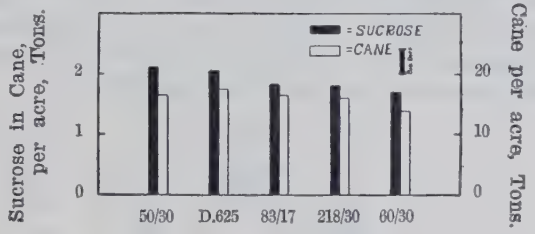

FIG. XVIII.

Sucrose and Cane Yields from Field 45 B., Wales (Plant Canes).

Rainfall was short on this experiment during the first three and from the ninth to the twelfth months of growth. It was unusually heavy during the fourth and thirteenth months.

The topsoil of Field 45 B., Wales, is a highly acidic pegassy clay overlying a similar subsoil. The organic matter content of the topsoil is normal, that of the subsoil above the average. The carbon : nitrogen ratios are very wide. The salinity of the topsoil is above the average, that of the subsoil being normal. The theoretical lime requirements of both topsoil and subsoil are above the average.

Pln. Uitvlugt—Field 42 W.—Plant Canes.

Table XXI and Figure XIX show the results obtained from the experiment in Field 42 W., Pln. Uitvlugt.

TABLE XXI.— **Results of a Variety Trial in Field 42 W., Uitvlugt.**

PLANTS, 14.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,	
						Tons.	% Mean.
MEAN YIELDS:	D. 49/30	19.62	15.70	5.00	90.6	3.07	158.25
	D. 9/28	17.81	16.04	4.39	90.7	2.85	146.91
	D. 625	12.57	14.60	11.26	85.5	1.84	94.85
	D. 218/30	11.81	14.87	5.75	89.0	1.75	90.21
	D. 1/28	11.08	14.86	6.35	89.3	1.65	85.05
	D. 2/30	10.36	14.37	5.93	88.2	1.46	75.26
	D. 573/22	6.44	14.70	6.85	87.9	0.96	49.48
	Mean :					1.94	100.00
	Standard Error :					0.29	14.95
	Significant Difference, 20 : 1 :					0.84	43.20

Growth was very poor on this pegassy soil and several varieties failed almost completely. D. 49/30 (parent : D. 625) and D. 9/28 (parents : S.C. 12/4 x D. 625) were exceptions to the general rule. Both gave much higher tonnages than the standard cane, D. 625, and distinctly better juices. Other experiments confirm the value of D. 49/30 as a plant cane. No ratoon data are available. D. 9/28 is known to ratoon well. In Field 13 E., Uitvlugt, it led D. 625 by a total of two tons of sucrose per acre after three harvests.

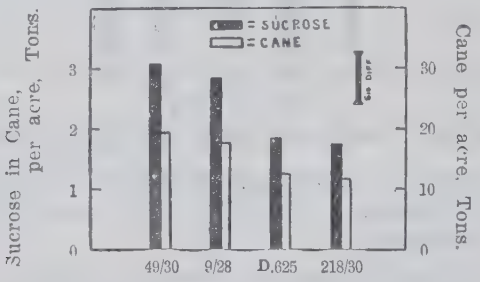

FIG. XIX.

Sucrose and Cane Yields from Field 42 W., Uitvlugt (Plant Canes).

Owing mainly to marked excesses over the average in the first, fifth and fourteenth months of growth, this experiment had a total of 4.22 in. more rainfall than might have been expected. During most of the growth period, however, rainfall was subnormal.

The topsoil of Field 42 W., Pln. Uitvlugt, is a markedly acidic pegassy clay overlying a highly acidic clay subsoil. The organic matter content of the topsoil is normal, that of the subsoil below the average. The carbon : nitrogen ratio of the topsoil is wide, that of the subsoil being narrow. The salinity of the topsoil is above the average, that of the subsoil normal. The theoretical lime requirements are normal.

SUB-SECTION B.—RATOON VARIETY TRIALS.

First Ratoon Variety Trials Reaped at Sophia Sugar Experiment Station.

Details of the reaping dates, layout, etc., of the four first ratoon experiments reaped at the Sophia Sugar Experiment Station during the period are given in Table XXII.

TABLE XXII.

First Ratoon Variety Trials Reaped at Sophia Experiment Station.

Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
		Previous Reaping.	Reaping.	Varieties.	Replicates.	
12 East	12.75	17.IX.34	7. X.35	5	5	Latin Square.
6 West A	12.00	15.IV.35	17.IV.36	3	6	Randomised Blocks.
6 „ B	12.00	15.IV.35	17.IV.36	3	6	„
13 „	12.00	17.IV.35	16.IV.36	4	7	„

Sophia Field—12 E.—First Ratoons.

The results secured from the trial in Field 12 E., Sophia, are presented in Table XXIII and Figure XX.

TABLE XXIII.

TABLE XXIII.— **Results of a Variety Trial in Field 12 East, Sophia.**

1ST RATOONS, 12.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 625	35.11	13.48	8.12	87.6	4.74	115.61	D. 625	9.45
	D. 684/21	36.37	12.30	12.00	83.5	4.46	108.78	D. 684/21	9.35
	D. 6/21	34.46	12.21	12.25	85.0	4.17	101.71	D. 6/21	8.81
	D. 666/18	32.27	12.31	8.68	86.1	3.98	97.07	D. 666/18	8.55
	D. 203/20	25.76	12.35	8.13	86.3	3.17	77.32	D. 203/20	8.18
	Mean:					4.10	100.00		
	Standard Error:					0.25	6.10		
	Significant Difference, 20: 1:					0.77	18.78		

(*Plant cane results reported in Sugar Bull. No. 4, p. 7.*)

The combined results for two crops indicate that none of the canes tested will outyield D. 625.

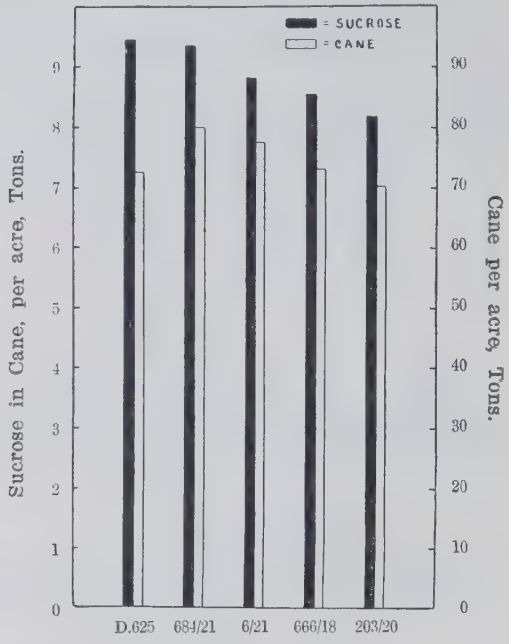

FIG. XX.

Sucrose and Cane Yields from Field 12 E., Sophia (Plant Canes, and First Ratoons).

Except for a dry September and low December at the start and an usually wet February when the canes were six months of age, the rainfall experienced by this trial was about normal.

The slightly acid clay soils of Field 12 E., Sophia, were discussed on page 9 of *Sugar Bulletin* No. 4.

Sophia—Field 6 W.—First Ratoons.

Table XXIV gives the results from the two trials in Field 6 W., Sophia.

TABLE XXIV.—**Results of 2 Variety Trials in Field 6 West, Sophia.**

1ST RATOONS, 12.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.	Combined Results for 2 Crops, Plants and 1st Ratoons. Variety.	Combined Results for 2 Crops, Plants and 1st Ratoons. Sucrose in Cane per Acre, Tons.
				Experiment A.					
MEAN YIELDS:	D. 625	25.51	13.49	7.94	85.5	3.45	106.15	D. 625	9.03
	D. 50/30	24.84	13.48	4.42	88.6	3.34	102.77	D. 50/30	8.47
	D. 43/30	22.64	13.03	5.70	87.6	2.95	90.77	D. 43/30	7.96
	Mean:					3.25	100.00		
	Standard Error:					...	...		
	Significant Difference, 20: 1:					...	...		
				Experiment B.					
MEAN YIELDS:	D. 625	28.32	13.48	9.37	85.6	3.83	105.80	D. 625	10.12
	D. 7/30	26.49	13.72	4.09	88.4	3.65	100.83	D. 7/30	8.63
	D. 10/30	23.85	14.10	3.92	88.9	3.37	93.09	D. 10/30	8.43
	Mean:					3.62	100.00		
	Standard Error:					...	...		
	Significant Difference, 20: 1:					...	...		

(*Plant cane results reported in Sugar Bull. No. 4, p. 18.*)

D. 625 heads the combined results of two crops in both trials. D. 50/30, which is second in Experiment A, has shown promise in other tests.

The total rainfall experienced by this trial was 5.54 in. above the normal. There was a marked deficit in December 1935 when the canes were eight months old.

The slightly acid clay of Field 6 W., Sophia, has been described on page 19 of *Sugar Bulletin* No. 4.

Sophia—Field 13 W.—First Ratoons.

Table XXV presents the results of the experiment in Field 13 W., Sophia.

TABLE XXV.—**Results of a Variety Trial in Field 13 West, Sophia.**

1ST RATOONS, 12.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre Tons.
MEAN YIELDS:	D. 625	20.94	14.44	6.65	88.6	3.01	112.31	D. 625	7.92
	D. 218/30	20.23	13.51	3.83	90.0	2.73	101.87	D. 218/30	7.03
	D. 136/30	20.35	12.81	5.27	88.7	2.60	97.01	D. 136/30	6.84
	D. 154/28	16.76	14.27	3.09	90.0	2.38	88.81	D. 154/28	6.14
	Mean:					2.68	100.00		
	Standard Error:					...	...		
	Significant Difference. 20: 1:					...	...		

(*Plant cane results reported in Sugar Bull. No. 4, p. 20.*)

Here again D. 625 leads in the combined results by a wide margin. The other varieties will be discarded.

The remarks made about rainfall when discussing the trials in Field 6 W., Sophia, above, apply to the experiment in Field 13 W., Sophia.

The markedly acidic silty clay of Field 13 W., Sophia, was discussed on page 22 of *Sugar Bulletin* No. 4.

SECOND RATOON VARIETY TRIALS REAPED AT SOPHIA SUGAR EXPERIMENT STATION.

Table XXVI gives details of the layout, etc., of the three second ratoon variety trials reaped at the Sophia Sugar Experiment Station.

TABLE XXVI.—**Second Ratoon Variety Trials Reaped at Sophia Experiment Station.**

Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
		Previous Reaping.	Reaping.	Varieties.	Replicates.	
1 East	11.75	28.IX.34	17.IX.35	6	8	Randomised Blocks.
1 West	12.00	1. X.34	3. X.35	3	8	,,
16 ,,	12.25	1.IV.35	8.IV.36	4	7	,,

Sophia —Field 1 E.—Second Ratoons.

The results of the test in Field 1 E., Sophia, are given in Table XXVII and shown graphically in Figure XXI.

TABLE XXVII.— **Results of a Variety Trial in Field 1 East, Sophia.**

2ND RATOONS, 11.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.		Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	Diamond 10	24.02	12.91	7.13	85.1	3.10	127.57	Diamond 10	11.62
	P.O.J. 2878	23.67	12.61	8.41	84.3	2.98	122.63	P.O.J. 2878	10.65
	D. 602/22	20.88	11.70	11.34	81.8	2.46	101.23	D. 602/22	9.38
	D. 663/13	19.10	11.59	9.34	83.1	2.23	91.77	D. 663/13	8.92
	D. 625	18.19	12.04	13.83	81.7	2.19	90.12	D. 625	8.63
	D. 195/17	13.28	12.20	13.22	81.4	1.63	67.08	D. 195/17	7.97
	Mean:					2.43	100.00		
	Standard Error:					0.24	9.88		
	Significant Difference, 20 : 1					0.68	27.98		

(*Plant cane results reported in Sugar Bull. No. 3, p. 14.*)

(*First ratoon results reported in Sugar Bull, No. 4, p. 24.*)

Diamond 10 and P.O.J. 2878 have shown marked superiority to D. 625. D. 602/22 has many good points but has developed some objectionable characteristics which have caused it to be discarded.

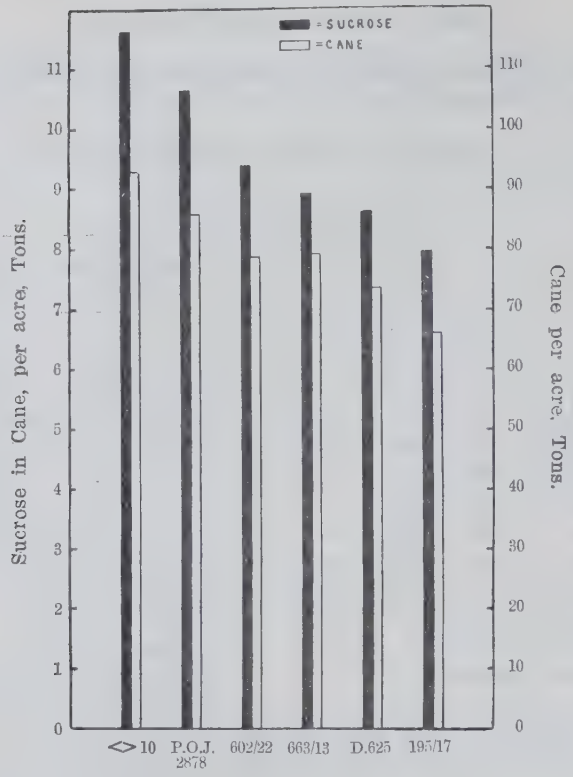

FIG. XXI.

Sucrose and Cane Yields from Field 1 E., Sophia (Plant Canes, First and Second Ratoons).

Except for a marked deficit during the third month of growth and a marked excess during the fifth, the rainfall experienced by this test was fairly normal.

The slightly acid heavy silt soil of this field has been described on page 14 of *Sugar Bulletin* No. 3.

Sophia—Field 1 W.—Second Ratoons.

Table XXVIII gives the data secured from the final reaping of the experiment in Field 1 W., Sophia.

TABLE XXVIII.—**Results of a Variety Trial in Field 1 West, Sophia.**

2ND RATOONS, 12.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 625	18.19	13.08	11.39	84.0	2.38	119.00	D. 625	9.77
	D. 880/21	14.52	13.41	7.40	86.8	1.96	98.00	D. 53/27	9.24
	D. 53/27	12.96	12.72	9.62	83.7	1.66	83.00	D. 880/21	9.14
	Mean:					2.00	100.00		
	Standard Error:					0.16	8.00		
	Significant Difference, 20: 1:					0.49	24.50		

(*Plant cane results reported in Sugar Bull. No. 3, p. 2.*)

(*First ratoon results reported in Sugar Bull. No. 4, p. 26.*)

None of the canes tested in this trial came up to D. 625.

Rainfall conditions for this trial were similar to those just reported for Field 1 E., Sophia.

The markedly acidic clay soil of this field was discussed on page 3 of *Sugar Bulletin* No. 3.

Sophia—Field 16 W.—Second Ratoons.

The results of the test in Field 16 W., Sophia, are presented in Table XXIX and Figure XXII.

TABLE XXIX.—**Results of a Variety Trial in Field 16 West, Sophia.**

2ND RATOONS, 12.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 625	26.23	13.67	9.14	84.6	3.60	103.75	D. 625	13.77
	D. 207/20	27.31	13.04	4.76	85.9	3.56	102.59	D. 444/21	13.70
	D. 895/22	24.94	13.60	4.35	87.4	3.40	97.98	D. 207/20	13.62
	D. 444/21	24.83	13.39	7.70	85.3	3.32	95.68	D. 895/22	13.29
	Mean:					3.47	100.00		
	Standard Error:					...	...		
	Significant Difference, 20: 1:					...	...		

(*Plant cane results reported in Sugar Bull. No. 3, p. 12.*)

(*First ratoon results reported in Sugar Bull. No. 4, p. 34.*)

D. 625 heads the combined results for three crops but the other varieties came fairly close behind. They have all done well in other trials and are being tested further.

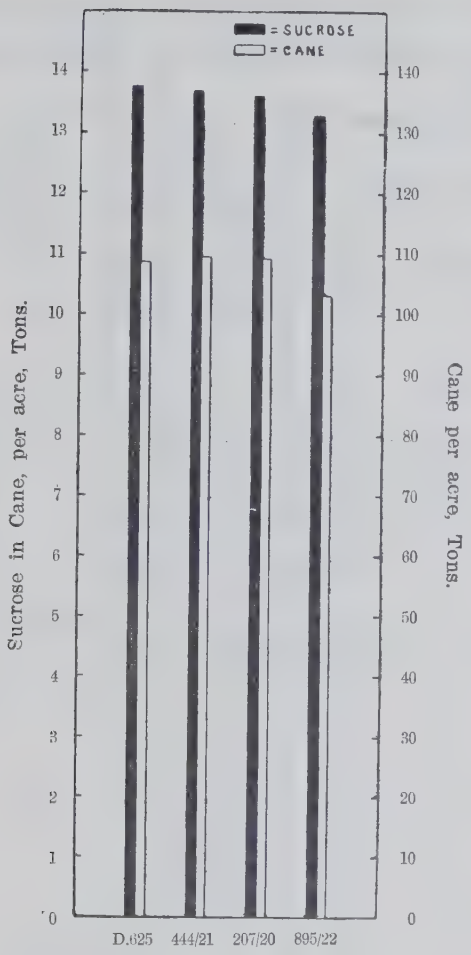

FIG. XXII.

Sucrose and Cane Yields from Field 16 W., Sophia (Plant Canes, First and Second Ratoons).

There was a total deficiency of 7.40 in. of rainfall from the normal. The drier months of August, September (1935) and March (1936) were better served than usual, but the weather was dry during the first and from the eighth to the eleventh months of growth.

The markedly acid fine silt soil of this field was described on page 13 of *Sugar Bulletin* No. 3.

Second RatoonVariety Trials Reaped in Berbice.

Table XXX gives details of the layout, etc., of the three second ratoon trials reaped in Berbice.

TABLE XXX.— **Second Ratoon Variety Trials Reaped in Berbice.**

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Previous Reaping.	Reaping.	Varieties.	Replicates.	
Port Mourant	28 A. Emp.	11.50	3.IV.35	17.III.36	3	6	Randomised Blocks.
,,	15 A.O.L.	11.00	18.IV.35	19.III.36	5	6	,,
Blairmont	4 H.	12.25	8.XI.34	14.XI.35	6	7	,,

Pln. Port Mourant—Field 15 A., O.L.—Second Ratoons.

The results of the trial in Field 15 A., O.L., Pln. Port Mourant, are given in Table XXXI and shown graphically in Figure XXIII.

TABLE XXXI.— **Results of a Variety Trial in Field 15 A.O.L., Port Mourant.**

2ND RATOONS, 11.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
	D. 9/28	46.38	14.94	3.99	88.1	6.97	123.58	D. 9/28	17.81
MEAN	D. 4/28	38.81	14.51	7.00	87.3	5.64	100.00	D. 625	17.57
YIELDS:	G. 119	35.79	15.24	4.59	88.8	5.41	95.92	G. 119	17.40
	D. 625	34.11	14.99	8.87	85.8	5.10	90.43	D. 4/28	16.68
	D. 11/28	34.36	14.77	4.60	88.0	5.08	90.07	D. 11/28	14.80
	Mean:					5.64	100.00		
	Standard Error:					0.31	5.50		
	Significant Difference, 20: 1:					0.91	16.13		

(*Plant cane results reported in Sugar Bull. No. 3, p. 16.*)
(*First ratoon results reported in Sugar Bull. No 4, p. 36.*)

D. 9/28 (parents: S.C. 12/4 x D. 625) heads the list in total yield for three crops, leading D. 625 by the small margin of a quarter of a ton of sucrose per acre. The cane has done well in Fields 13 E. and 42 W., Uitvlugt. G. 119 follows D. 625 closely. D. 11/28 proved unsatisfactory in this field. In other trials it has frequently outyielded D. 625.

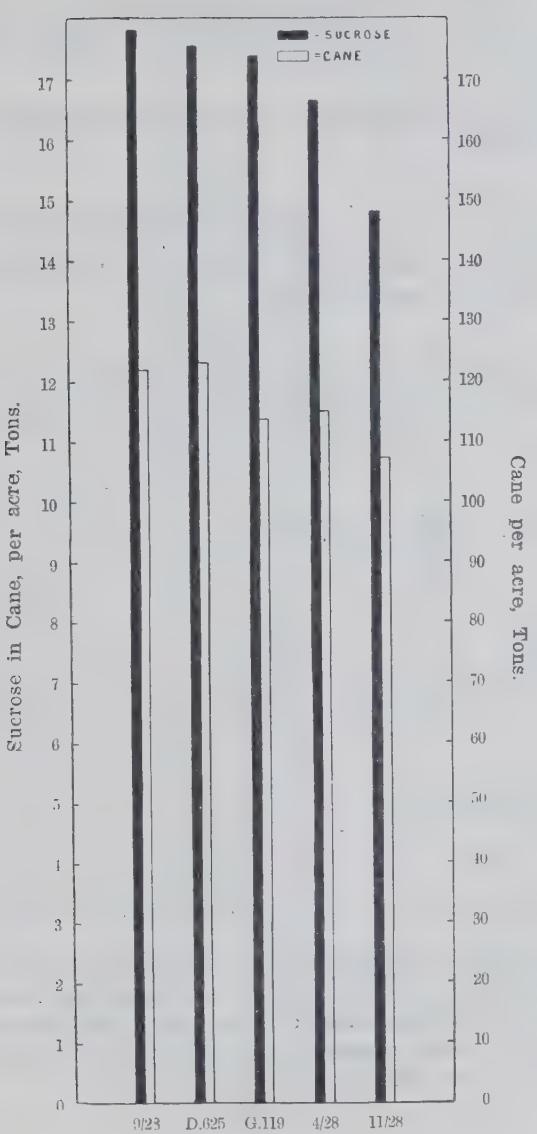

FIGURE XXIII.

Sucrose and Cane Yields from Field 15 A.O.L., Port Mourant (Plant Canes, First and Second Ratoons).

Rainfall was higher than usual during the first six months of growth, subnormal for the next four and unusually high during the month preceding harvest.

The markedly acidic clay soil of this site was discussed on page 16 of *Sugar Bulletin* No. 3.

Pln. Port Mourant—Field 28 A.E.—Second Ratoons.

Table XXXII and Figure XXIV show the results obtained from the trial in Field 28 A.E., Pln. Port Mourant.

TABLE XXXII.—**Results of a Variety Trial in Field 28 A.E., Port Mourant.**

2ND RATOONS, 11.50 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 309/21	34.16	15.76	4.78	87.9	5.39	112.06	D. 309/21	17.08
	D. 628/21	34.18	14.27	7.24	84.9	4.91	102.08	D. 628/21	16.29
	D. 625	29.47	14.12	13.53	81.3	4.13	85.86	D. 625	14.92
	Mean:					4.81	100.00		
	Standard Error:					...	...		
	Significant Difference, 20: 1:					...	...		

(*Plant cane results reported in Sugar Bull. No. 3, p. 18.*)

(*First ratoon results reported in Sugar Bull. No. 4, p. 38.*)

Both D. 309/21 and D. 628/21 have outyielded D. 625 in a district where the last-named does well. Indeed in this experiment the standard cane, has, for three crops, given the fine average of four tons of 96° sugar per acre whereas D. 628/21 (parent: D. 625) averaged over four and a third tons, and D. 309/21 (parent: D. 625) over four and a half tons.

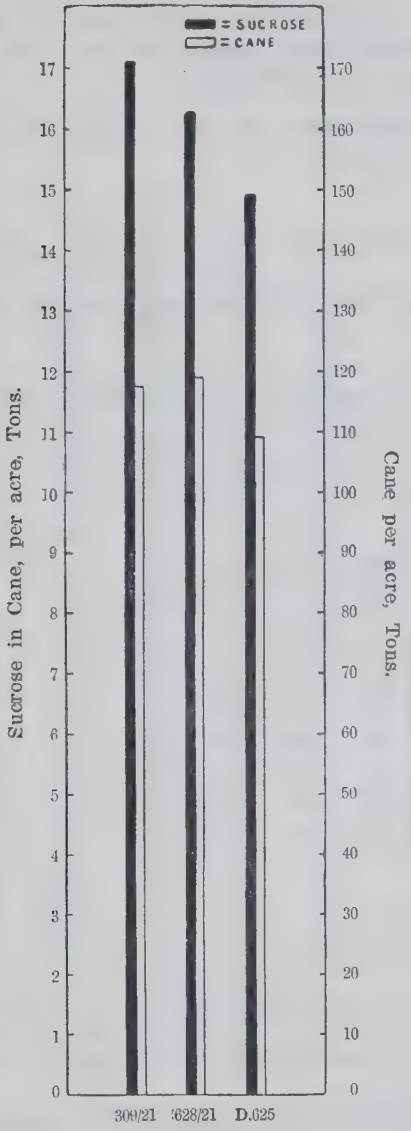

FIG. XXIV.

Sucrose and Cane Yields from Field 28 A.E., Port Mourant (Plant Canes, First and Second Ratoons).

Just after the harvest of the first ratoons, rainfall was low, but it was above normal for six months following. During the last four months the canes were growing, the precipitation was subnormal.

The markedly acidic heavy silt soil of this field has been described on page 18 of *Sugar Bulletin* No. 3.

Pln. Blairmont—Field 4 H.—Second Ratoons.

Table XXXIII and Figure XXV present the results obtained from Field 4 H., Blairmont.

TABLE XXXIII.— **Results of a Variety Trial in Field 4 H., Blairmont.**

2ND RATOONS, 12.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
	Diamond 10	41.49	14.01	8.14	88.7	5.80	126.09	P.O.J. 2878	19.17
	P.O.J. 2878	37.44	14.13	8.00	87.9	5.27	114.57	Diamond 10	18.75
MEAN	D. 857/21	36.39	12.90	14.27	83.2	4.71	102.39	D. 747/13	16.01
YIELDS:	D. 625	32.29	12.62	13.85	84.2	4.08	88.70	D. 857/21	15.69
	D. 747/13	31.01	12.74	11.18	85.8	3.95	85.87	D. 1034/22	14.39
	D. 1034/22	30.28	12.60	11.57	85.9	3.82	83.04	D. 625	13.87
	Mean:					4.60	100.00		
	Standard Error:					0.24	5.22		
	Significant Difference, 20: 1:					0.69	15.00		

(*Plant cane results reported in Sugar Bull. No. 3, p. 20.*)

(*First ratoon results reported in Sugar Bull, No. 4, p. 40.*)

The second ratoon yields were high and P.O.J. 2878 completed the three-crop cycle with a general average of over five tons of 96° sugar per acre. Diamond 10, which topped the second ratoon results, came second in total yield for three crops. D. 625, despite an average yield of over three and a half tons of sugar per acre, is last on the list. In the second ratoons P.O.J. 2878 and Diamond 10 had by far the best juice characteristics.

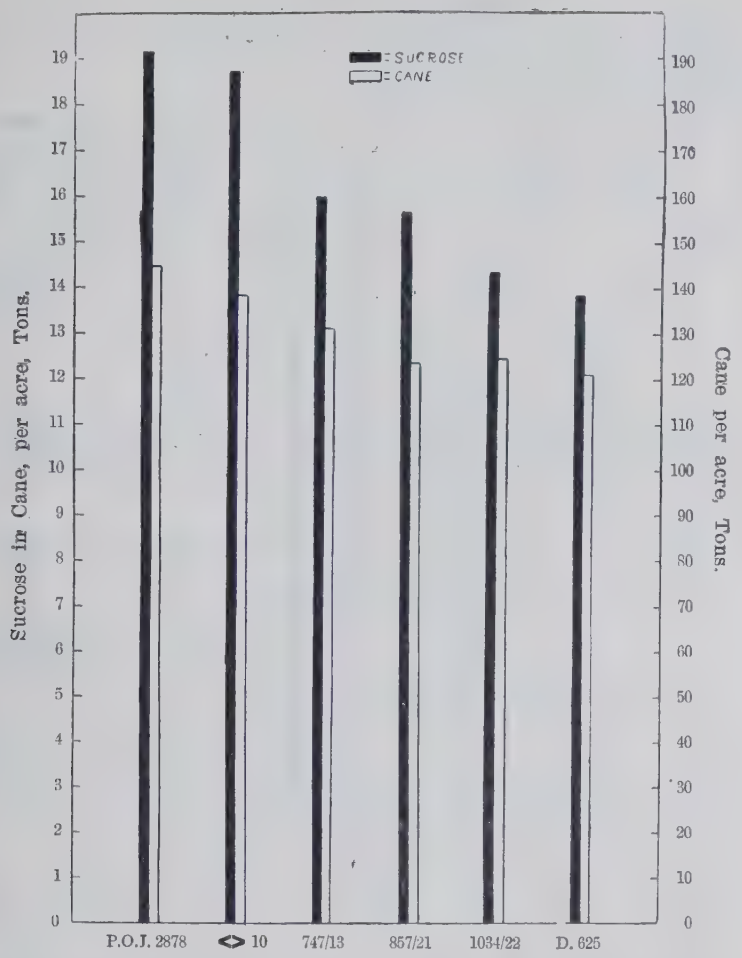

FIG. XXV.

Sucrose and Cane Yields from Field 4 H., Blairmont (Plant Canes, First and Second Ratoons).

Some thirteen inches of rain more than the normal fell on the second ratoons, the fourth and last five months of the growing season being unusually wet. Rainfall in the second, third, fifth and sixth months was below the average.

A discussion of the highly acidic pegassy clay soil of Field 4 H., Blairmont, will be found on page 20 of *Sugar Bulletin* No. 3.

Second Ratoon Variety Trials Reaped in East Demerara.

Table XXXIV gives the details of the reaping dates, layout, etc., of the two second ratoon tests reaped in East Demerara.

TABLE XXXIV.— **Second Ratoon Variety Trials Reaped in East Demerara.**

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Previous Reaping.	Reaping.	Varieties.	Replicates.	
Ogle	61 O.	12.00	27.IX.34	23.IX.35	5	8	Randomised Blocks.
Diamond	90 G.D.	11.75	4. X.34	24.IX.35	3	7	,,

Pln. Ogle—Field 61 O.—Second Ratoons.

Table XXXV contains the results from the second ratoon reaping of the trial in Field 61 O., Pln. Ogle. The yields for three crops are graphically shown in Figure XXVI.

TABLE XXXV.— **Results of a Variety Trial in Field 61 O., Ogle.**

2ND RATOONS, 12.00 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 625	31.93	13.14	15.09	84.0	4.20	111.11	P.O.J. 2878	13.59
	P.O.J. 2878	31.53	12.95	8.61	86.3	4.08	107.94	D. 1/28	11.14
	G. 119	29.17	13.77	7.92	88.1	4.01	106.08	D. 625	11.06
	D. 1/28	30.10	12.28	9.89	85.9	3.68	97.35	D. 13/28	9.72
	D. 13/28	22.79	12.83	11.47	85.1	2.92	77.25	G. 119	9.61
	Mean:					3.78	100.00		
	Standard Error:					0.18	4.76		
	Significant Difference, 20: 1:					0.52	13.76		

(*Plant cane results reported in Sugar Bull. No. 3, p. 24.*)

(*First ratoon results reported in Sugar Bull. No. 4, p. 42.*)

D. 625 headed the second ratoons, but in the total yield for three crops none of the canes approached P.O.J. 2878 which gave two tons of 96° sugar more than D. 625. Although reaped at twelve months as a second ratoon, D. 625 had a glucose ratio of over 15.

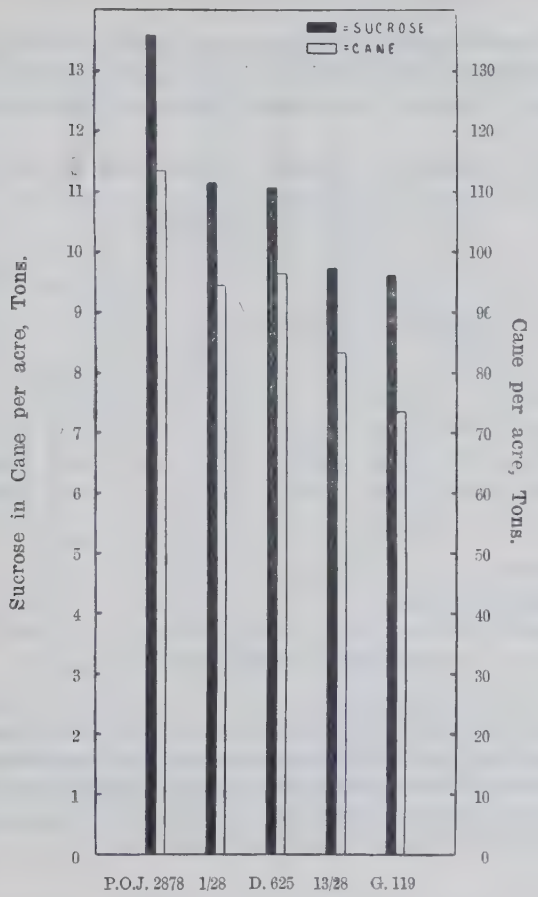

FIG. XXVI.

Sucrose and Cane Yields from Field 61 O., Ogle (Plant Canes, First and Second Ratoons).

Rain on this trial was somewhat short in the early months but there was a heavy fall at the fifth month and towards the end of the growing period several months surpassed the normal so that, in the end, there was a total of 7.94 in. more than might have been expected.

The highly acidic fine silt soil of Field 61 O., Pln. Ogle, has been discussed on page 24 of *Sugar Bulletin* No. 3.

Pln. Diamond—Field 90 G.D.—Second Ratoons.

The second ratoon results from the experiment in Field 90 G.D., Pln. Diamond, are given in Table XXXVI. Figure XXVII shows the total yield from the first and second ratoon crops. It had not been possible to reap the test as plant canes.

TABLE XXXVI.—**Results of a Variety Trial in Field 90 G.D., Diamond.**

2ND RATOONS, 11.75 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	P.O.J. 2753	38.23	11.57	16.14	82.9	4.42	113.04	P.O.J. 2753	8.12
	D. 857/21	31.23	11.69	26.88	75.8	3.66	93.61	D. 857/21	7.30
	Diamond 10	28.75	12.76	15.40	83.4	3.64	93.09	Diamond 10	6.79
	Mean:					3.91	100.00		
	Standard Error:					...	...		
	Significant Difference, 20: 1:					...	...		

(*First ratoon results reported in Sugar Bull. No. 4, p. 44.*)

It will be seen that P.O.J. 2753 gave over a ton of 96° sugar more than Diamond 10, the standard used, in the two ratoon crops. Its juice characteristics are not as good as those of Diamond 10, but, like some other thin canes, P.O.J. 2753 gives heavy cane tonnages under local conditions and is deserving of further consideration. D. 857/21 is a slow ripener with poor juice.

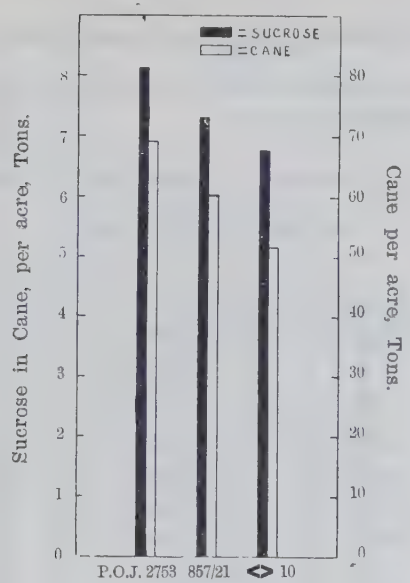

FIG. XXVII.

Sucrose and Cane Yields from Field 90 G.D., Diamond (First and Second Ratoons).

This experiment experienced excessive rains just after harvest and then two months of low precipitation. The fifth month of growth was satisfactory but the next three months had a total deficit of over ten inches from the normal rainfall. During the last four months the rains were heavier than usual.

The highly acidic pegassy clay of this field has been discussed on page 45 of *Sugar Bulletin* No. 4.

SECOND RATOON VARIETY TRIALS REAPED IN WEST DEMERARA.

Details of the second ratoon tests reaped in West Demerara during the period are to be found in Table XXXVII.

TABLE XXXVII.— **Second Ratoon Variety Trials Reaped in West Demerara.**

Estate.	Field.	Age of Canes, Months.	Date of		Number of		Type of Layout.
			Previous Reaping.	Reaping.	Varieties.	Replicates.	
Wales	4 B.	10.25	9.IV.35	19.II.36	8	6	Randomised Blocks.
Uitvlugt	13 E.	11.25	16.XI.34	25.X.35	5	8	,,

Pln. Wales—Field 4B.—Second Ratoons.

The results of the second ratoon trial in Field 4 B., Pln. Wales, appear in Table XXXVIII and Figure XXVIII.

TABLE XXXVIII.—**Results of a Variety Trial in Field 4 B., Wales.**

2ND RATOONS, 10.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, c %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	Co. 210	28.04	13.63	7.59	86.1	3.82	129.93	P.O.J. 2878	12.50
	P.O.J. 2878	24.13	14.09	8.09	87.5	3.40	115.65	◇ 10	12.38
	◇ 10	23.13	14.72	6.99	88.5	3.39	115.31	Co. 210	10.83
	P.O.J. 253	23.06	14.27	4.95	89.2	3.27	111.22	P.O.J. 253	10.76
	Co. 281	21.49	14.04	4.95	87.6	3.01	102.38	Co. 213	10.66
	Co 213	20.99	12.55	10.08	84.1	2.65	90.14	Co. 281	10.35
	D. 625	18.03	12.34	16.92	83.5	2.22	75.51	D. 625	9.63
	D. 814/12	13.26	13.27	9.45	86.0	1.76	59.86	D. 814/12	7.98
	Mean:					2.94	100.00		
	Standard Error:					0.16	5.44		
	Significant Difference, 20: 1:					0.46	15.65		

(*Plant cane results reported in Sugar Bull. No. 3, p. 26.*)

(*First ratoon results reported in Sugar Bull. No. 4, p. 46.*)

As a second ratoon, the outstanding cane is Co. 210. Considering the total yield for three crops, however, P.O.J. 2878 and Diamond 10 are preeminent. The four thin canes form a group under the varieties just mentioned, while D. 625 and D. 814/12 bring up the rear. For the convenience of the estate routine it was found necessary to reap the second ratoons very early. Except from D. 625, the glucose ratios and purities recorded were surprisingly satisfactory.

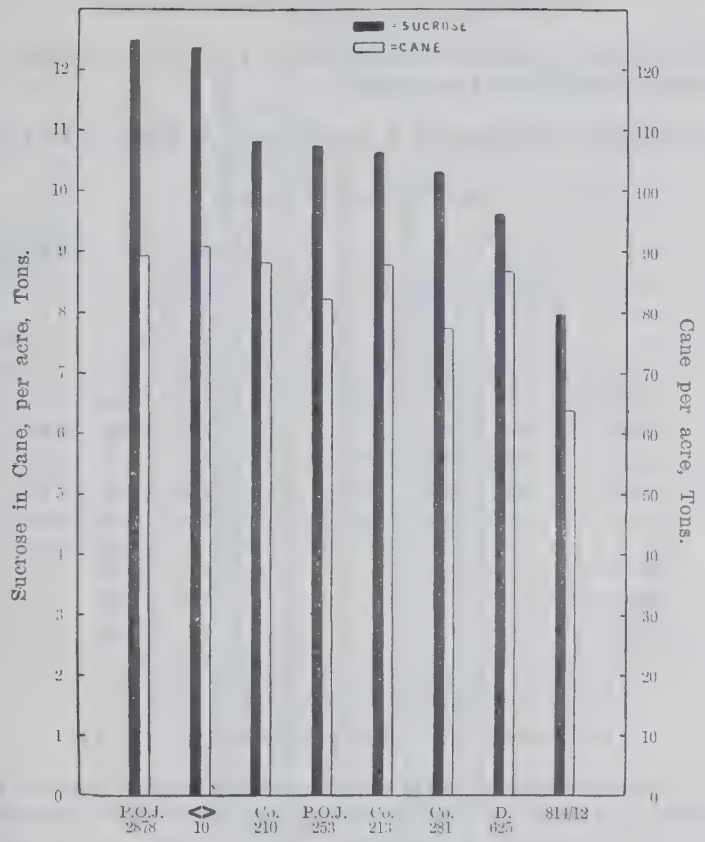

FIG. XXVIII.

Sucrose and Cane Yields from Field 4 B., Wales (Plant Canes, First and Second Ratoons).

The experiment was rather poorly served with rain, for, despite an excess of 10.70 in. over the normal at the third month, there was a total deficit of 9.60 in. at the end of the growing period.

The pegassy clay soil of Field 4 B., Pln. Wales, was described on page 26 of *Sugar Bulletin* No. 3.

Pln. Uitvlugt—Field 13 E.,—Second Ratoons.

Detailed results of the second ratoon trial in Field 13 E., Uitvlugt, are to be found in Table XXXIX and Figure XXIX.

TABLE XXXIX.—**Results of a Variety Trial in Field 13 E., Uitvlugt.**

2ND RATOONS, 11.25 months.									
	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 3 Crops. Plants, 1st and 2nd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
MEAN YIELDS:	D. 9/28	33.85	14.00	8.53	87.1	4.74	128.46	D. 11/28	14.09
	D. 11/28	29.60	13.00	11.92	84.4	3.85	104.34	D. 9/28	14.03
	D. 4/28	26.78	13.64	10.86	85.6	3.66	99.19	D. 4/28	12.19
	D. 625	28.07	12.19	18.48	79.2	3.43	92.95	D. 625	12.08
	D. 3/28	26.58	10.74	16.12	79.6	2.77	75.07	D. 3/28	11.1"
	Mean:					3.69	100.00		
	Standard Error:					0.15	4.06		
	Significant Difference, 20: 1:					0.44	11.92		

(*Plant cane results reported in Sugar Bull. No. 3, p. 27.*)

(*First ratoon results reported in Sugar Bull. No. 4, p. 48.*)

D. 9/28 is outstanding here as a second ratooner both as regards yield and juice qualities. It has shown similar tendencies in other trials. Over three crops it yielded practically the same total crop as D. 11/28. They are both well above D. 625. A small commercial extension of D. 11/28 has been advised for this estate.

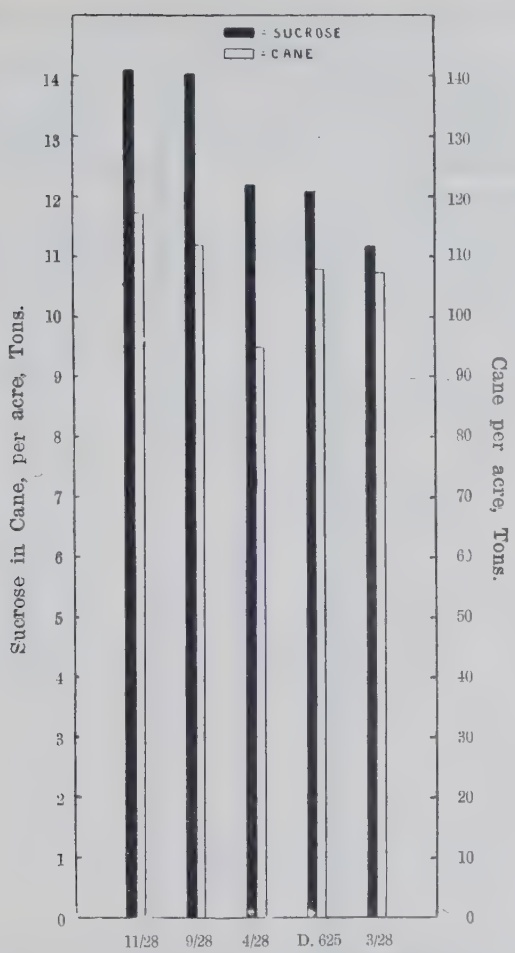

FIG. XXIX.

Sucrose and Cane Yields from Field 13 E., Uitvlugt (Plant Canes, First and Second Ratoons).

Rainfall on the second ratoons was low for the first two months, then excessive for the third and low again for the next three. After that the supply was ample.

The soil of Field 13 E., Uitvlugt, discussed on page 29 of *Sugar Bulletin* No. 3, is a highly acidic clay.

Third Ratoon Variety Trials Reaped in Berbice.

Pln. Blairmont—Field 18 R.—Third Ratoons.

The variety trials are not usually reaped beyond second ratoons, but as the Estate Authorities were carrying on Field 18 R., Pln. Blairmont, for a fourth crop, the opportunity was taken to follow the yield of the better varieties in the experiment in that field for another year.

The second ratoons had been harvested on 10.X.34 and the third ratoons were taken off at 13.25 months of age on 15.XI.1935. The three varieties occurred in seven randomised blocks and the results are presented in Table XL and Figure XXX.

TABLE XL.—**Results of a Variety Trial in Field 18 R., Blairmont.**

3rd Ratoons, 13.25 months.

	Variety.	Cane per Acre, Tons.	Sucrose in Cane, %.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 4 Crops, Plants, 1st, 2nd and 3rd Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
Mean Yields:	Diamond 10	28.39	15.56	5.00	90.1	4.42	117.24	Diamond 10	19.34
	D. 424/21	25.23	14.07	7.08	88.0	3.56	94.43	D. 424/21	17.26
	D. 625	24.11	13.73	10.14	86.6	3.32	88.06	D. 625	15.62
	Mean:					3.77	100.00		
	Standard Error:					0.22	5.84		
	Significant Difference, 20: 1:					0.68	18.04		

(*Plant cane results reported in Sugar Bull. No. 1, p. 18.*)
(*First ratoon results reported in Sugar Bull. No. 3, p. 42.*)
(*Second ratoon results reported in Sugar Bull. No. 4, p. 58.*)

Diamond 10 is well ahead as a third ratoon and also in total yield for four crops. D. 424/21 comes about midway between the standard cane, D. 625, and Diamond 10.

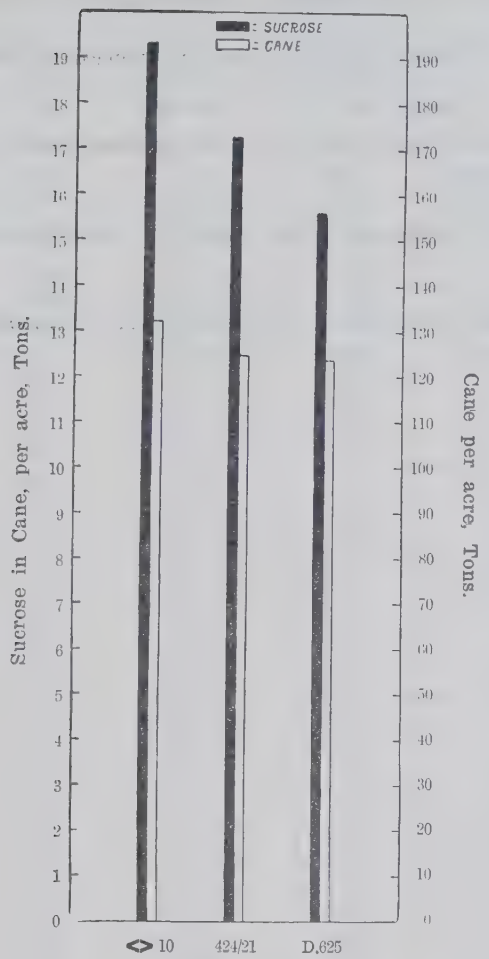

FIG. XXX.

Sucrose and Cane Yields from Field 18 R., Blairmont (Plant Canes, First, Second and Third Ratoons).

The first, fifth and last five months of the growing season had more rain than usual. There were deficits from the second to the fourth and from the sixth to the eighth months.

A discussion of the highly acidic fine silt soil of Field 18 R., Blairmont, will be found on page 17 of *Sugar Bulletin* No. 1.

SUB-SECTION C.—DISCUSSION AND SUMMARY OF RESULTS.

Tables XLI, XLII and XLIII summarise, respectively, the relative status of :—

(a) The varieties which have been reaped as plant canes, first ratoons and second ratoons ;

(b) The varieties which have been reaped as plant canes, and first ratoons only ;

(c) The varieties which have been reaped as plant canes only.

TABLE XLI.—**Mean Sucrose Yields from Three Crops.**

Variety.	Mean Sucrose, Tons per acre (Corrected Values),				Total Yield, D.625=100.0
	Plants.	First Ratoons.	Second Ratoons.	Total.	
Co. 210	4.98	4.17	5.11	14.26	126.08
P.O.J. 2878	**5.36**	**5.00**	**3.64**	**14.00**	**123.78**
Diamond 10	**5.14**	**4.37**	**4.42**	**13.93**	**123.17**
Co. 213	5.18	5.15	3.55	13.88	122.72
D. 857/21	4.79	4.90	3.81	13.50	119.36
P.O.J. 253	4.61	4.36	4.37	13.34	117.95
Co. 281	4.58	4.55	4.03	13.16	116.36
D. 309/21	5.15	3.69	3.88	12.72	112.47
P.O.J. 2727	4.37	**4.32**	3.83	12.52	110.70
D. 927/22	**5.18**	4.20	3.07	12.45	110.08
D. 747/13	**4.45**	4.12	2.88	12.45	110.08
P.O.J. 1499	4.03	3.21	5.16	12.40	109.64
D. 628/21	**4.77**	3.98	3.41	12.16	107.52
D. 9/28	**4.61**	3.38	4.08	12.07	106.72
D. 666/18	**4.56**	**3.73**	**3.18**	**11.47**	**101.41**
D. 207/20	4.68	3.81	2.89	11.38	100.62
D. 625	**4.67**	**3.67**	**2.97**	**11.31**	**100.00**
D. 1034/22	4.90	3.54	2.86	11.30	99.91
S.W. 3	4.89	3.43	2.95	11.27	99.65
D. 11/28	**4.87**	**3.28**	3.11	11.26	99.56
D. 444/21	4.66	3.84	2.74	11.24	99.38
D. 4/28	**4.61**	**3.36**	3.24	11.21	99.12
D. 424/21	**4.38**	**3.50**	**3.24**	**11.12**	**98.32**
D. 203/20	**4.34**	**3.34**	3.42	11.10	98.14
D. 241/21	**4.44**	3.51	3.15	11.10	98.14
D. 895/22	**4.56**	3.54	2.92	11.02	97.44
D. 602/22	**4.26**	**3.58**	**2.98**	**10.82**	**95.67**
D. 1/28	**4.31**	3.86	2.60	10.77	95.23
S.C. 12(4)	**3.90**	**3.56**	**3.26**	**10.72**	**94.78**
D. 880/21	4.41	3.75	2.45	10.61	93.81
D. 557/20	**4.19**	**3.29**	**3.07**	**10.55**	**93.28**
D. 684/21	**4.59**	**3.22**	2.70	10.51	92.93
G. 119	**4.05**	3.40	3.01	10.46	92.48
D. 814/12	**4.13**	**3.42**	**2.86**	**10.41**	**92.04**
D. 6/21	**4.37**	**3.15**	2.68	10.20	90.19
P.O.J. 213	3.48	3.06	3.66	10.20	90.19
D. 573/22	**4.33**	3.50	2.15	9.98	88.24
D. 195/17	**4.38**	3.38	2.21	9.97	88.15
D. 679/20	3.34	3.65	2.98	9.97	88.15
D. 53/27	**4.35**	3.65	1.89	9.89	87.44
D. 3/28	**3.83**	**3.35**	2.40	9.58	84.70
B.H. 10/12	**3.59**	**3.30**	**2.68**	**9.57**	**84.62**
D. 13/28	**3.94**	**2.72**	2.06	8.72	77.10

As forecasted in *Sugar Bulletin* No. 4, the reaping of further trials has improved the position of P.O.J. 2878 and this cane now leads Diamond 10 by an insignificant margin. They both yield, over a three-crop cycle, 23 per cent. more sucrose in cane per acre than D. 625, and in estate practice this margin is likely to be greater for they have purer and richer juices which give better factory recoveries than that of D. 625.

Attention is again called (see Figure XXXI) to the high positions held by some of the thin canes. In this Colony, accustomed for years to the stout D. 625, thin canes make their way with difficulty but some appear to be well adapted to local conditions and planters should give them consideration for certain localities on their estates, the while more experimental data about them are being accumulated.

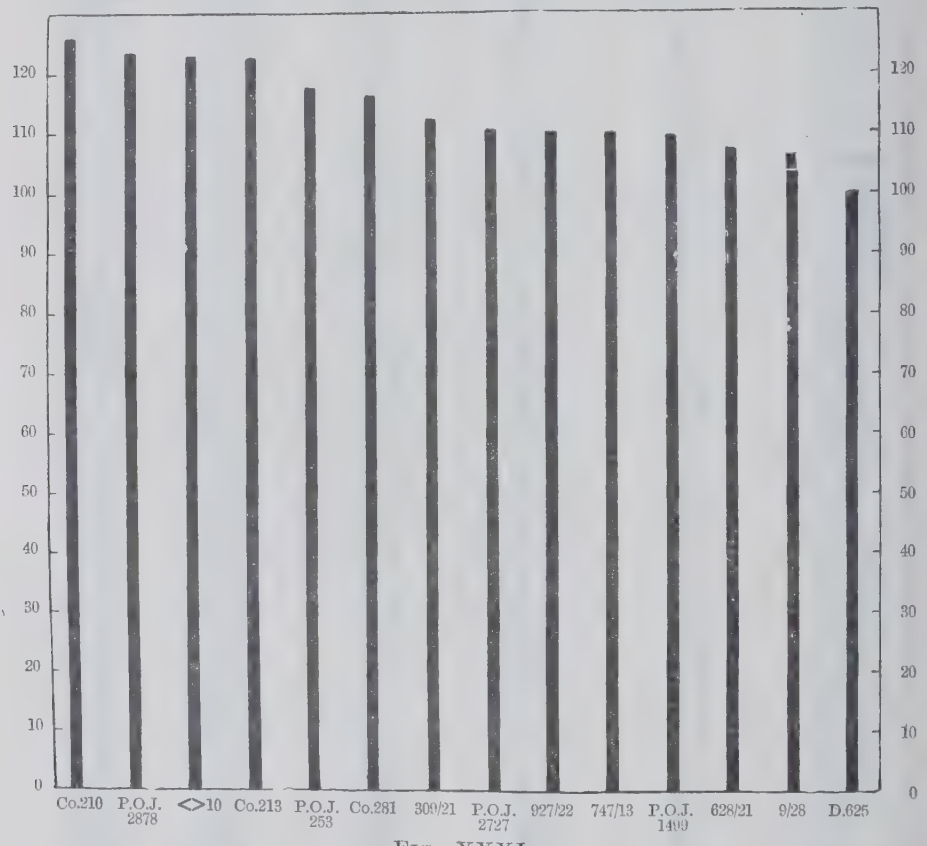

FIG. XXXI.

Comparison of the Average Sucrose Yields of Certain Varieties for Three Crops: D. 625=100.

So far as the older local seedlings are concerned, there were literally hundreds of them crowding the fields of the Station and the nurseries of certain estates six years ago. No one knew very much about them but some had shown promise in preliminary tests and some had attracted enough attention to be commercially extended in certain districts. There was no option but to settle down to the long and tedious routine of comparative tests in field trials. The work of the past six years has served to eliminate the vast majority and to concentrate attention on a few, notably certain 1921 and 1922 seedlings which appear in the upper part of Table XLI. With such a large number of seedlings on hand it was impossible to put each one into four or five tests at once. Could this have been done, the status of these better canes would now be definitely known. As it is, more trials have been started with D. 857/21, D. 309/21, D. 927/22, D. 747/13, etc., and their results must be awaited before definite recommendations can be made.

TABLE XLII.

Mean Sucrose Yields from Plant Canes and First Ratoons.

Variety.	Mean Sucrose, Tons per acre (Corrected Values),			Total Yield, D. 625=100.0
	Plants.	First Ratoons.	Total.	
P.O.J. 2878	**5.36**	**5.00**	**10.36**	**124.22**
Diamond 10	**5.14**	**4.37**	**9.51**	**114.03**
D. 404/17	4.83	3.59	8.42	100.96
D. 50/30	**4.84**	3.55	8.39	100.60
D. 625	**4.67**	**3.67**	**8.34**	**100.00**
D. 1431/22	4.78	3.36	8.14	97.60
D. 52/20	**4.78**	**3.27**	8.05	96.52
D. 92/17	**4.67**	3.18	7.85	94.12
D. 23/28	**4.15**	3.40	7.55	90.53
D. 154/28	**4.61**	2.90	7.51	90.05
D. 218/30	**4.11**	3.33	7.44	89.21
D. 43/30	4.19	3.14	7.33	87.89
D. 10/30	3.82	3.23	7.05	84.53
D. 136/30	3.87	3.17	7.04	84.41
D. 7/30	**3.44**	3.50	6.94	83.21
D. 10/28	**3.85**	2.48	7.33	75.90

Owing to the normal testing routine having been severely set back by the 1933-34 floods, there are comparatively few canes in Table XLII (varieties tested as plant canes and first ratoons only). None of those that does appear seems outstanding, but D. 404/17 and D. 50/30 need further consideration. On the other hand the last nine seedlings on the list will be discarded at once.

TABLE XLIII.

Mean Sucrose Yields from Plant Canes.

Variety.	Mean Sucrose, Tons per acre (Corrected Values).	Yield, D. 625=100.0
	Plants.	
D. 113/30	5.82	124.63
D. 170/30	5.77	123.55
D. 171/29	5.77	123.55
D. 49/30	**5.66**	**121.20**
D. 67/30	5.59	119.70
D. 232/30	5.56	119.06
D. 173/30	5.56	119.06
D. 219/30	5.42	116.06
D. 69/29	5.41	115.85
D. 75/30	5.38	115.20
P.O.J. 2878	**5.36**	**114.78**
D. 66/30	5.32	113.92
<> 10	**5.14**	**110.06**
D. 39/30	5.10	109.21
D. 84/30	5.05	108.14
D. 164/30	4.97	106.42
D. 87/27	4.95	106.00
D. 79/30	4.94	105.78
D. 150/30	4.94	105.78
D. 88/30	4.93	105.56
T. 1198	4.91	105.14
D. 103/30	4.91	105.14
D. 151/30	4.91	105.14
D. 11/24	4.90	104.92
D. 165/30	4.87	104.28
D. 71/30	4.85	103.85
D. 205/30	4.85	103.85
D. 235/30	4.85	103.85
D. 81/30	4.82	103.21
D. 167/30	4.78	102.36
B. 755	4.70	100.64
D. 147/30	4.70	100.64
D. 78/30	4.69	100.43
D. 625	**4.67**	**100.00**
D. 548/21	**4.67**	**100.00**
B. 417	4.64	99.36
D. 682/20	4.63	99.14
D. 134/27	4.63	99.14
D. 182/30	**4.59**	**98.29**
D. 74/30	4.57	97.86
D. 178/29	4.57	97.86
D. 140/29	4.57	97.86

TABLE XLIII.

Mean Sucrose Yields from Plant Canes—(Contd.).

Variety.	Mean Sucrose, Tons per acre (Corrected Values).	Yield, D. 625=100.0
	Plants.	
D. 178/30	4.44	95.07
D. 30/28	4.43	94.86
D. 183/29	4.35	93.15
D. 18/29	4.34	92.93
D. 19/30	4.33	92.72
D. 51/30	4.31	92.29
D. 75/29	4.30	92.08
D. 50/28	4.24	90.79
D. 64/30	**4.22**	**90.36**
D. 83/17	4.17	89.29
B. 726	4.16	89.08
D. 47/30	**4.09**	**87.58**
D. 57/27	4.09	87.58
D. 62/30	**4.06**	**86.94**
D. 24/30	**3.95**	**84.58**
D. 284/27	3.92	83.94
D. 76/29	3.68	78.80
D. 184/29	3.63	77.73
D. 2/29	3.58	76.66
D. 426/21	3.58	76.66
D. 2/30	**3.54**	**75.80**
D. 215/30	3.53	75.59
D. 31/30	3.51	75.16
D. 60/30	3.49	74.73
D. 163/29	3.47	74.30
D. 135/30	3.42	73.23
P.R. 820	3.41	73.02
D. 48/30	**3.39**	**72.59**
D. 16/29	3.37	72.16
D. 246/20	3.27	70.02
D. 38/30	3.21	68.74
D. 180/29	3.08	65.95
D. 63/30	3.02	64.67
D. 13/30	**2.97**	**63.60**
D. 6/30	2.17	46.47
D. 46/30	**2.09**	**44.75**

Most of the varieties which occur in Table XLIII were bred, since the reorganisation of the Station, in 1929 and 1930. Time has not yet permitted the accumulation of ratoon data for them, and in most cases the figures given are for one experiment only. D. 49/30 has, however, been reaped four times, D. 219/30 and D. 66/30 twice. Further experiments have been started with the canes in the upper part of the list; the majority of those in the latter half of the list have been already discarded.

The experiments confirm the suggestion already made that the change-over from D. 625 to P.O.J. 2878 and Diamond 10 should be accelerated. This does not mean that the D. 625 yields are falling off, for that variety is doing as well or better to-day than ever before. It means that in this country, under the same conditions of soil and climate, the two seedlings mentioned outyield D. 625 by a wide margin.

No better cane for local conditions than P.O.J. 2878 or Diamond 10 can definitely be pointed to at present but planters are advised to try a few fields of some of the thinner canes (*e.g.* Co. 210, Co. 213) and to establish nurseries of D. 309/21, D. 628/21, D. 857/21, D. 927/22, D. 9/28, D. 11/28, D. 49/30, and D. 66/30. Enough is known of these varieties to prevent any mistrust that they will be failures; they are likely, at least, to do as well as D. 625. On the other hand, much precious time will be saved if estates have nurseries established to permit rapid expansion of one or more should further experiments confirm or surpass present indications.

MANURIAL TRIALS.

This section deals with the results of twenty-five manurial trials reaped during the year ending June 30th, 1936. The arrangement of the section is similar to that followed in other *Bulletins*.

Samples of cane, collected from each plot of each experiment have been carefully examined in the laboratory at the Sophia Experiment Station. The results continue to show the advisability of conducting these tests when manurial requirements are being considered.

SUB-SECTION A.—EXPERIMENTS WITH NITROGENOUS MANURES.

(A1-A5) Sulphate of Ammonia on Flood-Fallowed Frontland (Second Ratoons, D. 625).

(*Plant cane results reported in Sugar Bull. No. 3, pp. 79-84.*)

(*First Ratoons results reported in Sugar Bull. No. 4, pp. 75-79.*)

These five trials constitute a chain of 4 x 4 latin squares designed to determine the optimum dressing of sulphate of ammonia for the standard cane variety, D. 625, growing on flood-fallowed frontland soils. The second ratoon plots were given the same doses of sulphate of ammonia as they received as plants and first ratoons.

The individual results of the five trials are presented in Table XLIV.

Table XLIV.

Effect of Sulphate of Ammonia on Second Ratoons of D.625 on Flood-Fallowed Frontland.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
Pln. Port	*Mourant,*	*Field 4 Hou*	*se End, Por*	*t Mourant*	*Empolder.*
0	17.16	12.79	2.19	86.0	8.99
2	25.71	12.85	3.28	84.6	9.53
4	36.23	12.99	4.62	83.1	11.52
6	36.93	12.74	4.70	82.8	12.45
Means	29.01	12.84	3.72	84.1	10.62

TABLE XLIV.—(*Contd.*).

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
Pln. Rose Hall, Field 30			*Rose*	*Hall.*	
0	18.96	15.69	3.01	88.1	6.64
2	20.22	16.41	3.21	88.0	6.46
4	28.47	15.23	4.52	86.7	8.80
6	27.22	16.11	4.32	88.2	7.38
Means	23.72	15.86	3.76	87.7	7.32
	Pln. Enmore, Field 8		*Bachelor's*	*Adventure.*	
0	32.24	15.22	4.75	86.2	8.25
2	34.11	14.86	5.03	85.5	9.21
4	38.45	14.47	5.70	84.7	9.99
6	40.59	14.51	6.00	83.9	10.41
Means	36.35	14.77	5.37	85.1	9.46
	Pln.	*Uitvlugt,*	*Field 14*	*Zeeburg.*	
0	24.69	13.69	3.32	86.8	7.28
2	28.85	13.66	3.88	84.6	10.45
4	35.35	13.03	4.75	84.7	11.14
6	39.14	13.42	5.26	83.8	12.25
Means	32.01	13.45	4.30	85.0	10.28
	Pln.	*Lusignan,*	*Field 85*	*Mon Repos.*	
0	15.08	14.43	2.18	87.5	7.84
2	18.06	14.42	2.61	87.3	7.24
4	17.00	14.53	2.46	88.0	8.27
6	20.84	14.50	3.02	86.9	8.76
Means	17.74	14.47	2.56	87.4	8.03

With the exception of Field 85 Mon Repos, Pln. Lusignan, the soils of these sites have been discussed in *Sugar Bulletin* No. 3, pp. 80-81.

The topsoil of Field 85 Mon Repos is a highly acidic clay overlying a markedly acidic clay subsoil. The topsoil has an average amount of organic matter with a normal carbon : nitrogen ratio. The subsoil contains an abnormal amount of organic matter of wide carbon : nitrogen ratio. The salinity of the area is low.

The rainfall experienced at the various centres is described in the following paragraphs.

Port Mourant. The rainfall was well distributed. It was slightly below the normal during the first six weeks, when little growth is to be expected, but during the major growing period the rainfall was in fair excess. The last three months of growth were marked by a dry spell, nevertheless the quality of the cane was poorer than in the two previous crops.

Rose Hall. The rainfall was not quite so well distributed as at Pln. Port Mourant. The young ratoons experienced an exceptionally dry spell for the first two months and this fact may have affected, to some extent, the response to nitrogen. During the major growing period the rainfall was in excess of the normal, while a dry spell was experienced during the last four months. The sucrose content of the cane and the juice purity were high.

Enmore. The rainfall was very well distributed. There was an excess of rainfall at the time of reaping the first ratoons but this does not seem to have affected the young spring. There was a dry spell just before the commencement of the main growing season. For the rest of the period the rainfall was well distributed. There was a dry spell for the three months preceding reaping. The cane was of good quality.

Uitvlugt. The rainfall was very well distributed. Dry weather was experienced during the first two months but during the main growing period the rainfall was adequate. The cane was reaped after a dry spell of four months and was of fair quality.

Lusignan. The rainfall was not well distributed at this centre. The cane experienced rainfall above the normal during the first two months, when little growth takes place, and then encountered drier weather during the major growth period. The latter part of the period was dry, but the cane was reaped after a month of heavy rainfall. The cane was of good quality.

The combined second ratoon results of the five latin squares are presented in Table XLV and are shown graphically in Figure XXXII where the results of previous crops are included for comparison.

TABLE XLV.

Effect of Sulphate of Ammonia on Second Ratoons of D. 625 on Flood-Fallowed Frontland (Combination of five experiments).

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	21.63	14.37	3.089	86.9	7.80
2	25.39	14.44	3.626	86.0	8.58
4	31.10	14.05	4.441	85.5	9.95
6	32.94	14.26	4.704	85.1	10.25
Means	27.77	14.28	3.965	85.9	9.14
S.E. of means	1.39	—	0.198	0.3	0.33
Significant Differences (20 : 1)	4.28	—	0.611	1.0	0.95

'Z' value obtained for effect of nitrogen on tonnage..... =1.9258
" " " " " " " " sucrose content..... =0.2479
" " " " " " " " juice purity..... =0.8306
" " " " " " " " glucose ratio..... =1.2507
" " required for P=0.05..... =0.5362
" " " " P=0.01..... =0.7531

The dressings of sulphate of ammonia had a general effect on the tonnage, the juice purity and the glucose ratio but were without effect on the sucrose content. The treatments had different effects in the various squares on the tonnage of cane. Sulphate of ammonia appears to have been most effective at Pln. Port Mourant and least effective at Pln. Lusignan.

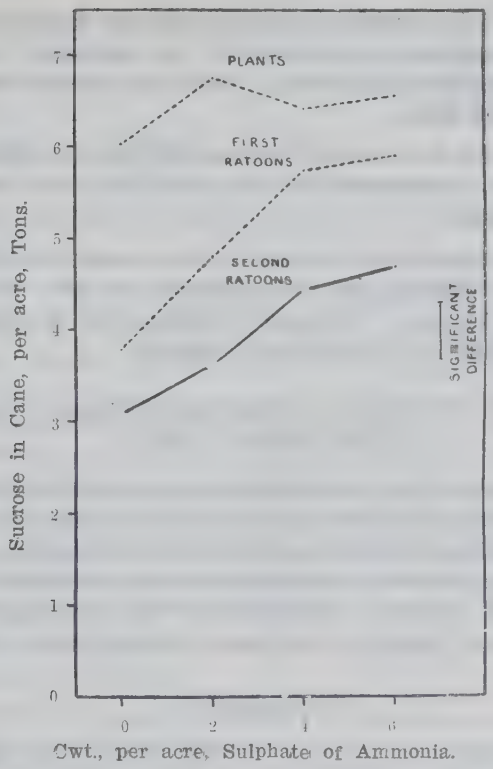

FIG. XXXII.

Effect of Sulphate of Ammonia on Flood-Fallowed Frontland

Conclusions :—The following general conclusions, referring to second ratoons of D. 625 on flood-fallowed frontland soils, may be drawn from these results :—

(a) The effect of environment and/or age of cane is very definite on tonnage, sucrose content, juice purity and glucose ratio.

(b) As far as tonnage is concerned, a dressing of sulphate of ammonia at the rate of 2 cwt. per acre gives no definite increased yield of cane. An application at the rate of 4 cwt. per acre gives a definite yield increase over the control plots and those receiving 2 cwt. per acre. A dressing at the rate of 6 cwt. per acre gives no definite increase in yield over that obtained with 4 cwt. per acre.

(c) Applications of sulphate of ammonia are without effect on the sucrose content of the cane.

(d) As regards juice purity a dressing of sulphate of ammonia at the rate of 2 cwt. per acre had no definite effect. An application at the rate of 4 cwt. per acre was responsible for a lower juice purity than that obtained on the control plots.

(e) An application at the rate of 2 cwt. per acre had no definite effect on the glucose ratio. Applications at 4 cwt. and 6 cwt. per acre had definite adverse effects.

(f) Since the treatments had no effect on the sucrose content of the cane the conclusions regarding the yield of sucrose per acre are similar to those concerning tonnage. The results indicate that, in general, an application at the rate of 4 cwt. per acre is desirable.

(A6—A9) Sulphate of Ammonia on Pegassy Clay (Plant Canes, D. 625).

In *Sugar Bulletin* No. 4, p. 82, there appears a table of the combined results of five experiments with graded dressings of sulphate of ammonia on plant canes of D. 625. This combination erroneously included the results of an experiment in Field No. 9 Cottage, Pln. Wales, which was planted to the variety Diamond 10. Table XLVI, which presents a combination of the remaining four squares, is therefore a correction of Table XLIV of *Sugar Bulletin* No. 4.

Table XLVI.

Effect of Sulphate of Ammonia on Plant Canes of D. 625, on Pegassy Clay (Combination of four experiments).

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	28.40	13.39	3.754	86.9	11.99
2	31.42	13.36	4.154	86.2	12.05
4	32.51	13.23	4.298	85.8	13.22
6	36.25	13.21	4.792	85.8	14.05
8	36.27	12,93	4.795	85.4	14.74
Means	32.97	13.22	4.359	86.0	13.21
S.E. of means	1.16	—	0.153	0.5	0.67
Significant Differences (20 : 1)	3.57	—	0.472	1.6	1.93

'Z' value obtained for effect of treatments on tonnage of cane..... =1.5269
" " " " " " " " sucrose content..... =0.2994
" " " " " " " " juice purity..... =0.4851
" " " " " " " " glucose ratio..... =0.5969
" " required for P=0.05..... =0.4947
" " " " P=0.01..... =0.6954

The general conclusions stated on pp. 83—84 of *Sugar Bulletin* No. 4 are slightly amended.

Conclusions :—Under the conditions of the experiments :—

(a) The effect of 'squares', *i.e.*, the effect of environment and/or age of cane is very definite on tonnage, sucrose content, juice purity and glucose ratio.

(b) A dressing of sulphate of ammonia at the rate of 2 cwt. per acre does not give a definite yield increase over the control. A dressing at the rate of 4 cwt. per acre is not definitely superior to a dressing at the rate of 2 cwt. per acre but gives a higher yield of sucrose than the control plots. Applications at the rate of 6 cwt. per acre give definitely higher yields of sucrose than do the smaller dressings. A dressing at the rate of 8 cwt. per acre has no further effect.

(c) The sucrose content of the cane is not definitely affected by applications of sulphate of ammonia.

(d) The juice purity appears to suffer a slight deterioration with increasing dressings of sulphate of ammonia.

(e) The heavier dressings of sulphate of ammonia have an adverse effect on the glucose ratio.

(A10) Sulphate of Ammonia on Pegassy Clay (First Ratoons, D. 625).

(Plant cane results reported in Sugar Bull. No. 4, pp. 80-84.)

This trial, conducted in Field No. 63 Melville, Pln. Cane Grove, is one of the chain of 5 x 5 latin squares dealing with the nitrogen requirements of D. 625 on pegassy clay soils. Other similar trials have been discussed in *Sugar Bulletin* No. 4, pp. 84-88. For the reasons there outlined the results of only two of the first ratoon trials can be combined statistically. Such a combination indicates that the effects of treatments between the two squares is so variable that no general recommendations can be made.

The rainfall was fairly well distributed at this centre. It was heavy during the first three months of the crop but it seems hardly likely that leaching would explain the lack of response to dressings of even 8 cwt. per acre of sulphate of ammonia. The crop received adequate rainfall during the major growing

period. The cane was of rather poor quality due, possibly, to abnormal rain for the month preceding grinding.

The results obtained at Pln. Cane Grove are presented in Table XLVII.

TABLE XLVII.

Effect of Nitrogen on First Ratoons of D. 625 on a Pegassy Clay at Pln. Cane Grove.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	36.00	12.66	4.46	83.4	13.86
2	34.67	12.82	4.29	85.0	13.07
4	35.23	12.31	4.36	84.1	13.06
6	36.51	12.02	4.52	81.2	15.69
8	33.03	12.07	4.09	82.6	14.21
Means	35.09	12.38	4.34	83.3	13.98
S.E. of means	—	—	—	0.6	—
Significant Differences (20 : 1)	—	—	—	1.9	—

'Z' value obtained for effect of nitrogen on tonnage of cane..... =0.0033
" " " " " " " " sucrose content..... =0.4188
" " " " " " " " juice purity..... =0.8614
" " " " " " " " glucose ratio..... =0.2865
" " required for P=0.05..... =0.5907
" " " " P=0.01..... =0.8443

Conclusions :—Under the conditions of the experiment :—

(a) Dressings of sulphate of ammonia had no effect on the tonnage of cane, the sucrose content or the glucose ratio.

(*b*) Dressings of sulphate of ammonia had a definite adverse effect on the juice purity.

(A11—A13) SULPHATE OF AMMONIA ON PEGASSY CLAY (SECOND RATOONS, D. 625).

(Plant Cane results reported in Sugar Bull. No. 3, pp. 97-100.)
(First Ratoons results reported in Sugar Bull. No. 4, pp. 84-89.)

These three trials form a chain of 5 x 5 latin squares laid down on pegassy clay to determine the optimum nitrogen requirements of D. 625. The soils of the experimental areas have been discussed on pp. 97-98 of *Sugar Bulletin* No. 3.

(A11) Pln. Lusignan, Field 4 East, Lusignan Empolder (Second Ratoons).

The rainfall was very well distributed. There was a dry period during the first two months, followed by adequate rainfall during the major growth period. The field was reaped after a dry period of three months. The cane was of fair quality.

The results obtained at Pln. Lusignan are given in Table XLVIII.

TABLE XLVIII.

Effect of Nitrogen on Second Ratoons of D. 625 on a Pegassy Clay at Pln. Lusignan.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	23.23	14.54	3.38	87.8	10.23
2	25.55	13.33	3.41	85.7	13.26
4	27.69	12.96	3.59	83.7	15.31
6	29.39	12.63	3.71	83.2	15.97
8	31.14	12.04	3.75	78.8	21.29
Means	27.40	13.10	3.59	83.8	15.21
S.E. of means	0.84	0.30	0.11	0.7	0.84
Significant Differences (20 : 1)	2.59	0.92	0.34	2.2	2.59

'Z' value obtained for effect of nitrogen on tonnage of cane..... =1.3159
" " " " " " " " sucrose content..... =1.1255
" " " " " " " " juice purity..... =1.5254
" " " " " " " " glucose ratio..... =1.5793
" " required for P =0.01..... =0.8443

Conclusions :—Under the conditions of the experiment :—

(a) Applications of sulphate of ammonia have had a marked effect on the tonnage and the sucrose content of the cane and on the purity and glucose ratio of the juice.

(b) The tonnage of cane varies directly as the amount of sulphate of ammonia applied.

(c) Applications of sulphate of ammonia have an adverse effect on the sucrose content of the cane and on the purity of the juice. The effect varies inversely as the rate of application.

(d) The glucose ratio increases as the rate of application of sulphate of ammonia increases.

(c) Applications at the rate of 6 cwt. and 8 cwt. per acre give definitely higher yields of sucrose than the controls.

(*A12*) *Pln. Uitvlugt, Field 94 Met-en-Meerzorg* (*Second Ratoons*).

The rainfall was not well distributed at this centre. During the first two and a half months the precipitation was below normal. Adequate rainfall was experienced for the first month of the main growing period, but during the greater part of this period the rainfall was subnormal. The June rains were excessive but were probably too late to neutralise the ill-effects of previous dry weather. The cane was of poor quality.

The results obtained at Pln. Uitvlugt are given in Table XLIX.

TABLE XLIX.

Effect of Nitrogen on Second Ratoons of D. 625 on a Pegassy Clay at Pln. Uitvlugt.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	16.62	12.29	2.13	80.4	15.99
2	12.23	12.91	1.57	81.8	15.28
4	11.87	13.46	1.52	83.6	12.52
6	11.81	12.91	1.51	81.3	15.85
8	14.11	12.48	1.81	80.8	16.28
Means	13.33	12.81	1.71	81.6	15.18

'Z' value obtained for effect of nitrogen on tonnage of cane =negative.
" " " " " " " " sucrose content =0.1314
" " " " " " " " juice purity =0.2358
" " " " " " " " glucose ratio =0.1528
" " required for P =0.05 =0.5907
" " " " P =0.01 =0.8443

Conclusions:—Under the conditions of the experiment:—

(a) Dressings of sulphate of ammonia were without effect on the tonnage, sucrose content, juice purity and glucose ratio.

(*A13*) *Pln. Versailles, Field 31 R. D. Z.* (*Second Ratoons*).

The rainfall was well distributed at this centre. During the first two months, when little growth takes place, the rainfall was subnormal. During the major

growth period the rainfall was adequate. During the last five months of the cycle the rainfall was subnormal. The cane was of good quality.

The results obtained at Pln. Versailles are presented in Table L and shown graphically in Figure XXXIII.

TABLE. L.

Effect of Nitrogen on Second Ratoons of D. 625 on a Pegassy Clay at Pln. Versailles.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	15.52	13.95	2.18	88.1	9.90
2	19.30	14.19	2.71	86.4	10.61
4	21.52	14.36	3.02	86.4	10.32
6	22.21	14.14	3.12	85.3	11.55
8	23.08	13.49	3.24	86.1	12.95
Means	20.33	14.03	2.85	86.5	11.07
S.E. of means	0.68	...	0.10	...	...
Significant Differences (20 : 1)	2.10	...	0.30	...	...

'Z' value obtained for effect of nitrogen on tonnage of cane = 1.4889
" " " " " " " " sucrose content = negative.
" " " " " " " " juice purity = 0.4220
" " " " " " " " glucose ratio = 0.3326
" " required for P=0.05 = 0.5907
" " " " P=0.01 = 0.8443

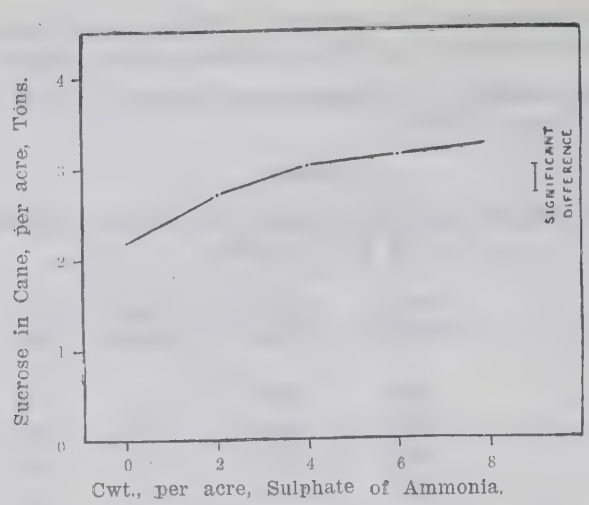

FIG. XXXIII.

Effect of Sulphate of Ammonia on Pegassy Clay (D. 625 : Second Ratoons).

Conclusions :—Under the conditions of the experiment :—

(a) Applications of sulphate of ammonia to second ratoons of the variety D. 625 growing on pegasse soil have a beneficial effect on the yields of cane and sucrose. The treatments have no definite effect on the quality of the cane.

(b) Applications at the rate of 2 cwt. and 4 cwt. per acre give definite increases in yield. Applications at the rate of 6 cwt. and 8 cwt. per acre give no definite increase in yield over that obtained with 4 cwt. per acre of sulphate of ammonia.

A statistical examination of the combined results of the three experiments indicated that the effects of treatments from square to square were so variable that no general recommendation could be made regarding the nitrogen requirements of D. 625 second ratoons growing on pegassy clay.

Experiments A1—A13 are concerned with the nitrogen requirements of the standard cane, D. 625. The remaining trials reported in this sub-section are concerned with the nitrogen requirements of the varieties P.O.J. 2878 and Diamond 10.

(A14) SULPHATE OF AMMONIA ON FLOOD-FALLOWED FRONTLAND (PLANT CANES, P.O.J. 2878).

The trial was conducted in Field No. 8 Springlands, Pln. Skeldon. The topsoil of the area consists of a slightly acidic clay overlying a markedly acidic

clay. The topsoil contains less than the normal amount of organic matter. The carbon : nitrogen ratio is narrow. The soil of the area is highly saline.

The rainfall at this centre was not well distributed although a heavy tonnage of cane was obtained. The first two months of the major growth period were marked by dry weather and the abnormal rain in February came at an opportune time. During the remainder of the period the rainfall was slightly subnormal. The cane was of fair quality.

The results obtained are presented in Table LI.

TABLE LI.

Effect of Sulphate of Ammonia on Plant Canes of P.O.J. 2878 on Flood-Fallowed Frontland at Pln. Skeldon.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0.00	62.49	14.30	8.94	86.5	7.53
2.50	66.17	13.64	9.03	85.5	9.14
3.75	64.95	13.38	8.69	86.2	8.51
5.00	66.57	13.00	8.65	84.2	10.73
Means	65.04	13.58	8.83	85.6	8.98
S.E. of means	—	0.23	—	—	0.62
Significant Differences (20 : 1)	—	0.67	—	—	1.80

'Z' value obtained for effect of nitrogen on tonnage of cane = negative.
" " " " " " " " sucrose content = 0.8594
" " " " " " " " juice purity = 0.5225
" " " " " " " " glucose ratio = 0.7677
" " required for P=0.05 ..... = 0.4176
" " " " P=0 01 ..... = 0.5902

Conclusions :—Under the conditions of the experiment :—

(a) The treatments have had no definite effect on the tonnage of cane or on the juice purity.

(b) The treatments have had an adverse effect on the sucrose content of the cane and on the glucose ratio.

(A15) SULPHATE OF AMMONIA ON FLOOD-FALLOWED FRONTLAND (PLANT CANES, P.O.J. 2878).

The trial was conducted in Field No. 45 Ogle, Pln. Ogle. The topsoil of the area is a highly acidic clay overlying a similar subsoil. The organic matter

content is below the normal and the carbon : nitrogen ratio is narrow. The salinity of both topsoil and subsoil is above the average.

The rainfall at this centre was not well distributed. For the first six months the precipitation was subnormal and it was not until late in the major growing season that adequate rainfall was experienced. The latter part of this season was marked by two months of subnormal rainfall. During the last six months of the period the rainfall was above the normal. The cane was of fair quality.

The results obtained are presented in Table LII and shown graphically in Figure XXXIV.

TABLE LII.

Effect of Sulphate of Ammonia on Plant Canes of P.O.J. 2878 on Flood-Fallowed Frontland at Pln. Ogle.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	33.93	13.37	4.57	85.3	8.64
2	44.41	13.65	6.00	86.5	6.71
3	43.60	13.67	5.89	86.5	6.65
4	46.44	13.30	6.25	85.6	7.45
Means	42.10	13.50	5.68	86.0	7.36
S.E. of means	1.03	...	0.14	...	...
Significant Differences (20 : 1)	3.00	...	0.40	...	...

'Z' value obtained for effect of nitrogen on tonnage of cane = 1.6847
" " " " " " " " sucrose content = negative
" " " " " " " " juice purity = 0.1168
" " " " " " " " glucose ratio = 0.3157
" " required for P = 0.05 ..... = 0.5427
" " " " P = 0.01 ..... = 0.7631

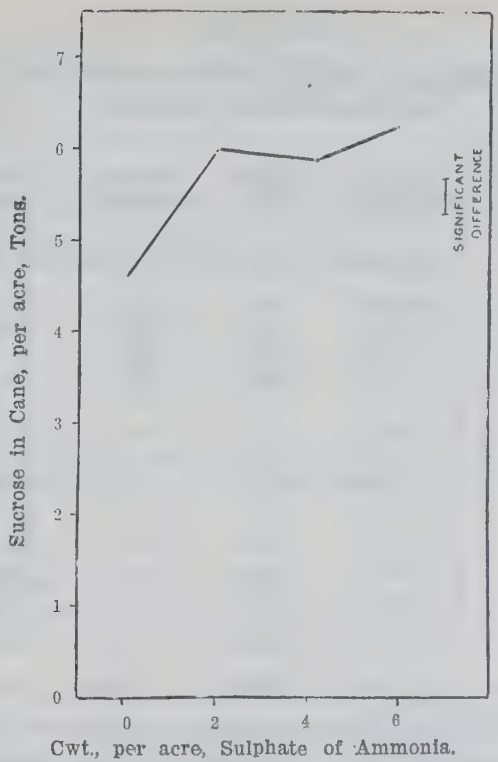

FIG. XXXIV.

Effect of Sulphate of Ammonia on Flood-Fallowed Frontland. (P.O.J. 2878 : Plant Canes).

Conclusions:—Under the conditions of the experiment:—

(a) Applications of sulphate of ammonia have a marked effect upon the yield of P.O.J. 2878 plant canes but have no effect on the juice purity.

(b) A dressing at the rate of 2 cwt. per acre is responsible for an increase of 1.43 tons of sucrose per acre (25.2 per cent. of the mean). Heavier applications have no further definite effect.

(A16-A17) SULPHATE OF AMMONIA ON FLOOD-FALLOWED FRONTLAND (FIRST RATOONS, P.O.J. 2878).

Two trials were conducted in order to investigate the nitrogen requirements of P.O.J. 2878 first ratoons. The separate results are given in Table LIII while the combined results are shown in Table LIV and presented graphically in Figure XXXV.

TABLE LIII.

Effect of Sulphate of Ammonia on First Ratoons of P.O.J. 2878 on Flood-Fallowed Frontland.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
	Pln. Skeldon, Field No. 8 Eliza and Mary.				
0	25.14	14.17	3.56	85.8	6.72
2	33.23	14.15	4.70	86.6	6.33
4	39.18	14.16	5.55	85.5	7.79
6	41.14	13.91	5.72	85.5	7.77
Means	34.67	14.10	4.88	85.8	7.15
	Pln. Lusignan, Field No. 26 West, Lusignan				
0	18.44	14.24	2.68	87.0	7.50
2	24.67	14.69	3.58	88.2	6.57
4	30.73	14.86	4.46	88.2	7.60
6	35.96	14.35	5.22	85.7	9.27
Means	27.45	14.53	3.98	87.3	7.73

The topsoil of Field No. 8 Eliza and Mary is a highly acidic clay overlying a markedly acidic clay subsoil. The topsoil contains less and the subsoil more than the normal amount of organic matter. The carbon : nitrogen ratio of the topsoil is narrow, that of the subsoil is normal. The salinity is above the average.

The rainfall at this centre was not well distributed. During the first four months of the crop the rainfall was sub-normal. Adequate rainfall was only experienced for one month during the major growth period. The last four months of the crop were marked by abnormal rainfall. The cane was of good quality.

The topsoil of Field No. 26 West, Lusignan, is a markedly acidic heavy silt overlying a slightly acidic clay. The topsoil contains a normal amount of organic matter while the subsoil contains more than the average of this constituent. The carbon : nitrogen ratios are normal. The topsoil possesses an average salinity, that of the subsoil is below the normal.

The rainfall experienced at this centre was deficient and not well distributed. During the major growth period the precipitation was subnormal. The cane was of good quality.

TABLE LIV.

Effect of Sulphate of Ammonia on First Ratoons of P.O.J. 2878 on Flood-Fallowed Frontland (Combination of two experiments).

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	21.79	14.21	3.120	86.4	7.11
2	28.95	14.42	4.146	87.4	6.45
4	34.95	14.51	5.005	86.8	7.70
6	38.55	14.13	5.520	85.6	8.52
Means	31.06	14.32	4.448	86.6	7.44
S.E. of means	0.90	..	0.129	0.3	0.26
Significant Differences (20:1)	2.71	..	0.388	0.9	0.75

'Z' value obtained for	effect of nitrogen on tonnage of cane	=2.6928
,, ,, ,, ,,	,, ,, ,, ,, sucrose content	=0.2090
,, ,, ,, ,,	,, ,, ,, ,, juice purity	=0.9740
,, ,, ,, ,,	,, ,, ,, ,, glucose ratio	=1.1854
,, ,, required for	P=0.05	=0.5362
,, ,, ,, ,,	P=0.01	=0.7531

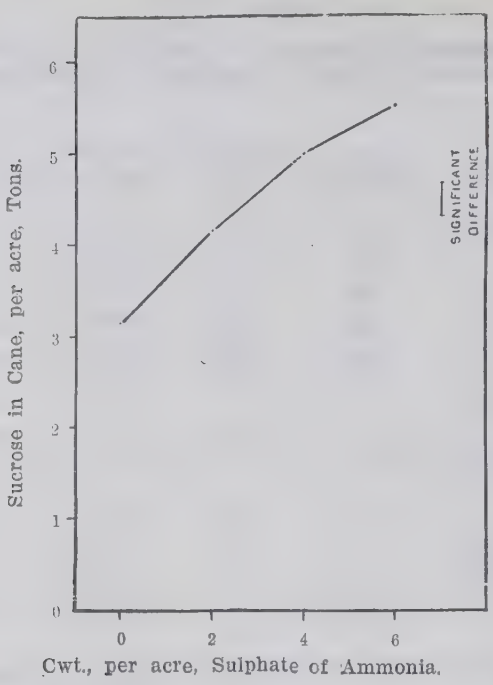

FIG. XXXV.

Effect of Sulphate of Ammonia on Flood-Fallowed Frontland (P.O.J. 2878 : First Ratoons; Combination of two experiments).

Conclusions:—Under the conditions of the experiment:—

(a) Applications of nitrogen have had a definite effect on the tonnage of cane, the juice purity and the glucose ratio. They are without effect on the sucrose content of the cane.

(b) Increasing dressings of sulphate of ammonia up to 6 cwt. per acre produced increases in yield of sugar.

(c) As regards juice purity the dressings of sulphate of ammonia have had an unusual effect. An application at the rate of 2 cwt. per acre has actually been responsible for a definite increase in the juice purity. The heaviest application has had a depressing effect.

(d) The heavier dressings (4 cwt. and 6 cwt per acre) of sulphate of ammonia have had a definite adverse effect on ripening as evidenced by the values for the glucose ratio.

(A 18) Sulphate of Ammonia on Flood-Fallowed Frontland (First Ratoons, Diamond 10).

This trial was laid out in Field No. 7, Eliza and Mary, Pln. Skeldon and consisted of three 4 x 4 latin squares. The topsoil of the area is a highly acidic clay overlying a markedly acidic clay subsoil. The organic matter content of the topsoil is below the normal, that of the subsoil is above the average. The carbon : nitrogen ratio of the topsoil is narrow, that of the subsoil is normal. The salinity of both topsoil and subsoil is high.

The rainfall at this centre was not well distributed. During the first four months of the crop the rainfall was subnormal. Adequate rainfall was only experienced for one month during the major growth period. The last four months of the crop were marked by abnormal rainfall. The cane was of good quality.

The results obtained are given in Table LV and are presented graphically in Figure XXXVI.

Table LV.

Effect of Sulphate of Ammonia on First Ratoons of Diamond 10 on Flood-Fallowed Frontland at Pln. Skeldon.

S/A., ! Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	27.40	14.78	3.97	86.1	7.19
2	35.16	14.56	5.31	86.1	7.50
4	36.64	14.34	5.31	85.7	8.07
6	38.42	14.33	5.57	85.4	8.12
Means	34.40	14.50	4.99	85.8	7.72
S.E. of means	0.78	..	0.11	..	..
Significant Differences (20:1)	2.28	..	0.33	..	..

'Z' value obtained for effect of nitrogen on tonnage of cane =1.8284
" " " " " " " " sucrose content =0.3652
" " " " " " " " juice purity =0.3230
" " " " " " " " glucose ratio =0.4515
" " required for P = 0.05.....=0.5508
" " " " P = 0.01.....=0.7757

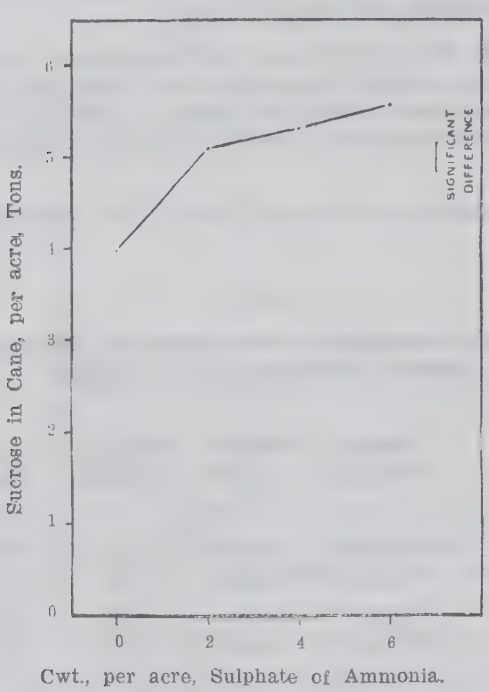

FIG. XXXVI.

Effect of Sulphate of Ammonia on Flood-Fallowed Frontland (Diamond 10 : First Ratoons).

Conclusions :—Under the conditions of the experiment :—

(a) Applications of sulphate of ammonia have had a definite effect upon the tonnage of cane but are without effect on the quality and ripening of the cane.

(b) A dressing of sulphate of ammonia at the rate of 2 cwt. per acre gives a definite increase in yield over the control. A dressing at the rate

of 4 cwt. per acre gives no definite increase in yield over that obtained with the 2 cwt. application. A dressing at the rate of 6 cwt. per acre does not give a definite increase in yield over that obtained with a dressing at the rate of 4 cwt. per acre. It gives however a definitely higher yield than that obtained with an application of 2 cwt. per acre.

(A19) Sulphate of Ammonia on Pegassy Clay. (Plant Canes, P.O.J. 2878).

This trial was laid down in Field No. 33 East, Pln. Uitvlugt. The topsoil of the area is a markedly acidic pegassy clay overlying a highly acidic clay subsoil. The organic matter content of the topsoil is above the normal, that of the subsoil is below the average. The carbon: nitrogen ratio of the topsoil is normal, that of the subsoil is narrow. The salinity is above the average.

The rainfall at this centre was deficient and not well distributed. During the first half of the major growing period the rains were adequate but the latter part was marked by two months of dry weather. The cane was of good quality.

The results obtained are given in Table LVI and are presented graphically in Figure XXXVII.

Table LVI.

Effect of Sulphate of Ammonia on Plant Canes of P.O.J. 2878 on a Pegassy Clay at Pln. Uitvlugt.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	19.77	14.49	2.88	90.3	6.71
2	23.74	14.61	3.46	89.6	7.36
4	27.72	14.73	4.04	90.9	6.67
6	31.65	14.76	4.62	90.7	6.70
8	37.07	14.38	5.41	90.1	8.10
Means	27.99	14.59	4.08	90.3	7.11
S.E. of means	1.20	...	0.18	...	...
Significant Differences (20:1)	3.70	...	0.54	...	...

'Z' value obtained for effect of nitrogen on tonnage of cane = 1.7268
" " " " " " " " sucrose content = negative
" " " " " " " " juice purity = negative
" " " " " " " " glucose ratio = negative
" " required for P = 0.05 = 0.5907
" " " " P = 0.01 = 0.8443

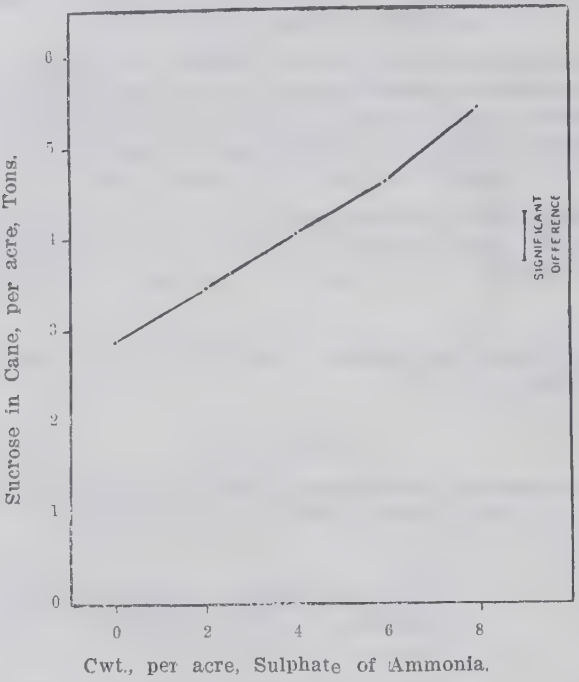

FIG. XXXVII.

Effect of Sulphate of Ammonia on Pegassy Clay (P.O.J. 2878 : Plant Canes).

Conclusions:—Under the conditions of the experiment:—

(a) Dressings of sulphate of ammonia have a definite effect on the tonnage of cane but are without effect on the sucrose content, the juice purity and the glucose ratio.

(b) A dressing at the rate of 2 cwt. per acre gives a definite increase over the control plot yields, a dressing at the rate of 4 cwt. per acre gives

a higher yield than that obtained with a dressing at 2 cwt. per acre. A dressing at the rate of 6 cwt. per acre gives a definitely higher yield than that obtained with a dressing of 4 cwt. per acre, while a dressing at the rate of 8 cwt. per acre gives a definitely higher yield than that obtained with a dressing at the rate of 6 cwt. per acre.

(A20) Sulphate of Ammonia on Pegassy Clay (First Ratoons, Diamond 10).

(Plant cane results reported in Sugar Bull. No. 4., p. 81 where the plant cane yields were erroneously ascribed to the variety D. 625).

The soil of Field No. 9 Cottage, Pln. Wales, has been previously described.

The rainfall at this centre was below normal but was well distributed. Adequate rainfall was experienced during the major growing period. The last six months of the crop were marked by dry weather. The sucrose content and the juice purity were high.

The results of the first ratoon trial are presented in Table LVII while these results and those for the plant cane crop are graphically recorded in Figure XXXVIII.

Table LVII.

Effect of Sulphate of Ammonia on First Ratoons of Diamond 10 on a Pegassy Clay at Pln. Wales.

S/A., Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
0	25.44	15.03	3.82	91.1	4.99
2	29.57	15.28	4.44	90.4	5.36
4	32.52	14.68	4.88	91.2	5.65
6	32.69	15.18	4.90	91.4	5.10
8	32.72	14.85	4.91	90.1	5.33
Means	30.59	15.00	4.59	90.8	5.29
S.E. of means	1.26	...	0.19	...	...
Significant Differences (20 : 1)	3.88	...	0.58	...	...

'Z' value obtained for effect of nitrogen on								tonnage of cane	=0.9275
,,	,,	,,	,,	,,	,,	,,	,,	sucrose content	=negative
,,	,,	,,	,,	,,	,,	,,	,,	juice purity	=negative
,,	,,	,,	,,	,,	,,	,,	,,	glucose ratio	=negative
,,	,,	required for P = 0.01							=0.8443

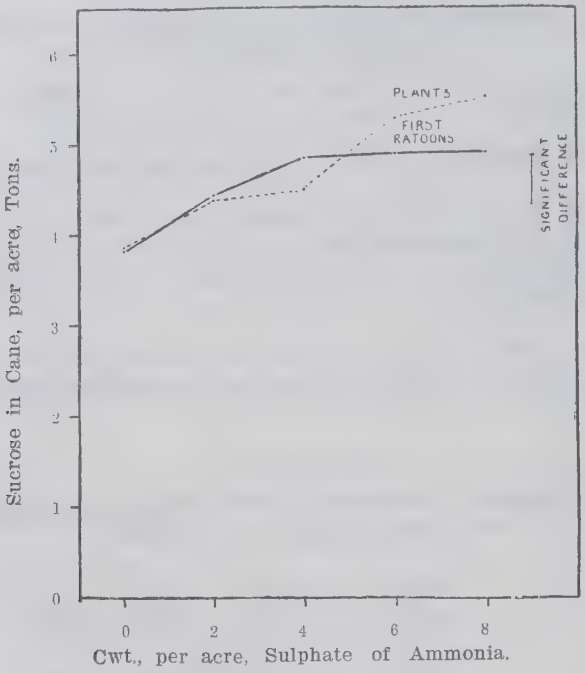

FIG. XXXVIII.

Effect of Sulphate of Ammonia on Pegassy Clay (Diamond 10).

Conclusions:—Under the conditions of the experiment:—

(a) Applications of sulphate of ammonia have had a definite effect on the tonnage of cane but are without effect on the sucrose content, the juice purity and the glucose ratio.

(b) A dressing at the rate of 2 cwt. per acre produces a definite increase in yield over that obtained on the control plots.

(c) Heavier applications of sulphate of ammonia have no further definite effect on the yield.

(A21-A23) Comparison of Sulphate of Ammonia and Calcium Cyanamide on Pegassy Clay (Plant Canes, Diamond 10).

This chain of three 5 x 5 latin squares was designed to compare the effects of sulphate of ammonia and calcium cyanamide on plant canes of the variety Diamond 10 growing on pegassy clay. The experiments also furnish information regarding the effect of applications of ground limestone in the presence of sulphate of ammonia or of calcium cyanamide. These latter points are considered in the following sub-section (Exps. B1—B3).

The individual results of the three trials are presented in Table LVIII.

Table LVIII.

Comparison of the Effects of Sulphate of Ammonia and Calcium Cyanamide on Plant Canes of Diamond 10 on Pegassy Clay.

	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
	Pln. Uitvlugt, Field 90, Met-en-Meerzorg.				
Sulphate of Ammonia	26.04	14.06	3.66	87.2	10.06
Calcium Cyanamide	22.38	14.20	3.18	86.4	10.38
Means	24.21	14.13	3.42	86.8	10.22
	Pln. Uitvlugt, Field 72, De Kinderen.				
Sulphate of Ammonia	30.14	12.94	3.90	84.6	13.33
Calcium Cyanamide	29.84	13.28	3.96	85.3	13.12
Means	29.99	13.11	3.93	85.0	13.22
	Pln. Leonora, Field N.E.A., Cornelia Ida.				
Sulphate of Ammonia	39.89	14.90	5.94	89.4	6.29
Calcium Cyanamide	38.29	15.15	5.80	89.6	6.26
Means	39.09	15.02	5.87	89.5	6.28

The topsoil of Field 90, Met-en-Meerzorg, Pln. Uitvlugt, is a highly acidic pegassy clay overlying a clay of similar reaction. The organic matter content of the topsoil is below normal, that of the subsoil is higher than the average. The carbon : nitrogen ratio is narrow. The salinity of the topsoil is normal, that of the subsoil is above the average.

This centre experienced a normal amount of rain which was not well distributed. It was only in the latter part of the major growing season that the cane received adequate rainfall. The cane was of good quality.

The topsoil of Field No. 72 De Kinderen, Pln. Uitvlugt, is a highly acidic pegasse overlying a highly acidic pegassy clay. The organic matter content is above the average and the carbon: nitrogen ratios are wide. The salinity is above the normal.

The rainfall at this centre was slightly below normal but was somewhat better distributed than at the previous centre. Adequate rain was experienced at the beginning and the end of the major growth period, but dry weather was experienced during the rest of this crop. The cane was of fair quality.

The topsoil of Field N.E.A., Cornelia Ida, Pln. Leonora, is a highly acidic pegassy clay overlying a highly acidic clay. The organic matter content is above the average. The carbon: nitrogen ratio of the topsoil is wide, that of the subsoil normal. The salinity is above the average.

The rainfall at this centre was below the normal but was fairly well distributed. Adequate rainfall was experienced for the first part of the major growth period but was followed by a dry spell of two months. Subsequently the rainfall was adequate. For the three months prior to reaping the precipitation was subnormal.

The three experimental areas received slightly varied amounts of nitrogenous manures. The trial in Met-en-Meerzorg concerned applications of sulphate of ammonia at the rate of 2 cwt. per acre and equivalent dressings of calcium cyanamide, the trial in De Kinderen concerned dressings of sulphate of ammonia at the rate of 1.8 cwt. per acre and equivalent dressings of calcium cyanamide, while the trial in Cornelia Ida concerned applications of sulphate of ammonia at the rate of 2.5 cwt. per acre and equivalent amounts of cyanamide nitrogen.

In spite of the slight variation in rate of application the results have been combined and are presented in Table LIX.

TABLE LIX.

Comparison of the Effects of Sulphate of Ammonia and Calcium Cyanamide on Plant Canes of Diamond 10 on Pegassy Clay (Combination of three experiments).

	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
Sulphate of Ammonia	32.02	13.97	4.515	87.0	9.89
Calcium Cyanamide	30.17	14.22	4.254	87.1	9.92
Means	31.10	14.10	4.385	87.0	9.90
S.E. of means	0.62	...	0.088	...	...
Significant Differences (20 : 1)	1.79	...	0.252	...	...

'Z' value obtained for effect of source of nitrogen on cane tonnage = 0.7453
" " " " " " " " " " sucrose content = negative
" " " " " " " " " " juice purity = negative
" " " " " " " " " " glucose ratio = negative
" " required for P = 0.05 ..... = 0.7141

Conclusions:—Under the conditions of the experiment :—

(a) Applications of sulphate of ammonia gave a slightly heavier tonnage of cane than equivalent dressings of calcium cyanamide.

(b) There were no differences in the effects of equivalent dressings of sulphate of ammonia and of calcium cyanamide on the sucrose content of the cane, the juice purity or on the glucose ratio.

SUB-SECTION B. EXPERIMENTS WITH LIMING MATERIALS.

(B1—B3) Liming Materials in Presence of Sulphate of Ammonia or Calcium Cyanamide on Pegassy Clay (Plant Canes, Diamond 10).

The results here described were obtained in the complex experiments considered in the previous sub-section (A17—A20). The trials included applications of liming materials in the presence of sulphate of ammonia or calcium cyanamide. The results of the individual experiments are given in Table LX.

Table LX.

Effect of Liming Materials on Plant Canes of Diamond 10 on Pegassy Clay.

	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
	Pln. Uitvlugt, Field 90, Met-en-Meerzorg.				
Lime	24.36	14.19	3.44	86.1	10.40
No Lime	24.07	14.07	3.40	87.5	10.04
Means	24.22	14.13	3.42	86.8	10.22
	Pln. Uitvlugt, Field 72, De Kinderen.				
Lime	30.93	13.16	4.06	85.2	12.86
No Lime	29.05	13.07	3.81	84.8	13.60
Means	29.99	13.12	3.94	85.0	13.23
	Pln. Leonora, Field N.E.A., Cornelia Ida.				
Limestone	38.70	15.23	5.82	90.0	5.88
No Limestone	39.48	14.83	5.93	88.9	6.66
Means	39.09	15.03	5.88	89.4	6.27

The combined results of the three trials are given in Table LXI.

TABLE LXI.

Effect of Liming Materials on Plant Canes of Diamond 10 on Pegassy Clay (Combination of three experiments).

	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
Liming materials	31.76	14.20	4.478	87.1	9.71
No liming materials	30.42	13.99	4.289	87.0	10.10
Means	31.09	14.10	4.384	87.0	9.90

'Z' value obtained for effect of liming materials on tonnage of cane =0.4237
" " " " " " " " " sucrose content =0.4028
" " " " " " " " " juice purity =negative
" " " " " " " " " glucose ratio =negative
" " required for P=0.05..... =0.7141

Conclusions:—Under the conditions of the experiments:—

(a) Applications of liming materials at the rate of one ton per acre have no definite effect on the tonnage of cane, the sucrose content of the cane, the juice purity or the glucose ratio.

(B4—B6) EFFECT OF LIMING MATERIALS ON FLOOD-FALLOWED FRONTLAND.

This chain of experiments originally consisted of five 5 x 5 latin squares and was designed to investigate the effects of small applications of slaked lime and of pulverised limestone on yield. Owing to labour disturbances two of the trials were not weighed. The individual results of the three other trials are presented in Table LXII.

TABLE LXII.

Effect of Liming Materials on Plant Canes on Flood-Fallowed Frontland.

Applications, per acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
	Pln. Blairmont, Field 71, Bush Lot. D. 625.				
Nil	62.75	12.16	7.39	82.5	14.32
½ ton P. limestone	62.26	12.00	7.33	84.0	15.14
1 ton P. limestone	63.66	11.59	7.49	82.9	14.59
½ ton Slaked lime	65.18	11.97	7.67	83.5	13.94
1 ton Slaked lime	61.86	11.15	7.28	81.2	14.94
Means	63.14	11.77	7.43	82.8	14.59
	Pln. Albion, Field 31, Kilcoy. D. 625.				
Nil	50.83	12.13	6.13	83.6	15.41
½ ton P. limestone	50.05	11.85	6.04	83.7	14.97
1 ton P. limestone	48.37	11.92	5.83	84.2	12.63
½ ton Slaked lime	49.38	12.32	5.96	83.8	13.49
1 ton Slaked lime	53.06	12.09	6.40	83.9	12.77
Means	50.34	12.06	6.07	83.9	13.85
	Pln. Enmore, Field 16, East, Paradise. Diamond 10.				
Nil	47.11	12.54	5.92	86.3	13.58
½ ton P. limestone	50.32	12.31	6.32	85.1	14.19
1 ton P. limestone	47.09	12.19	5.92	85.1	13.89
½ ton Slaked lime	47.66	12.89	5.99	85.7	12.04
1 ton Slaked lime	47.56	12.87	5.97	85.7	12.01
Means	47.95	12.56	6.02	85.6	13.14

The topsoil of Field No. 71 Bush Lot is a highly acidic clay overlying a markedly acidic clay subsoil. The organic matter content of the topsoil is below the average that of the subsoil is normal. Both topsoil and subsoil are of an average salinity.

The rainfall at this centre was above the normal but was not very well distributed. During the greater part of the major growth period the rainfall was low and subnormal. The heavy February rains probably alleviated the position. During the last four months of the crop the rainfall was high. The yield of cane was heavy but the quality was poor.

The topsoil of Field No. 31 Kilcoy is a slightly acidic clay overlying a similar subsoil. The organic matter content of the topsoil is normal, that of the subsoil is above the average. The carbon : nitrogen ratio of the topsoil is narrow, that of the subsoil is wide. The salinity is above the average.

The rainfall at this centre was above the normal but was not very well distributed. As in the case of the Blairmont trial the rainfall was low during the greater part of the major growth period though heavy rain was experienced during February. During the last five months of the crop the rainfall was above the normal. The yield of cane was heavy but of poor quality.

The topsoil of Field No. 16 Paradise is a highly acidic clay overlying a similar subsoil. The organic matter content is normal and the carbon : nitrogen ratio of an average value. The salinity is normal.

The rainfall at this centre was below the normal and was not very well distributed. Dry weather was experienced until the latter part of the major growth period and heavy rainfall obtained during the latter part of the crop. The yield of cane was fairly heavy but the quality was poor.

The combined results of the three trials are presented in Table LXIII.

TABLE LXIII.

Effect of Liming Materials on Plant Canes on Flood-Fallowed Frontland (Combination of three experiments).

	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
Liming material	53.87	12.17	7.576	84.1	13.72
No Liming material	53.57	12.28	6.546	84.1	14.43
Means	53.72	12.22	6.561	84.1	14.08

'Z' value obtained for effect of liming material on tonnage of cane =negative
" " " " " " " " " sucrose content =negative
" " " " " " " " " juice purity =negative
" " " " " " " " " glucose ratio =negative

Conclusions :—Under the conditions of the experiments :—

(a) Dressings of liming materials at rates varying from one half to one ton per acre have no immediate effect in the plant cane crop on the tonnage of cane, the sucrose content, the juice purity or the glucose ratio.

SUB-SECTION C.—EXPERIMENTS WITH PHOSPHATIC MANURES.

In the previous Bulletin (pp. 89-93) the plant cane results of six experiments with phosphatic fertilisers were reported. The three trials here discussed were designed to investigate the residual effects of applications of superphosphate applied at planting and to ascertain the response to dressings applied both to the plant canes and to the first ratoons.

The rainfall at Pln. Port Mourant was slightly subnormal but was well distributed. The young spring experienced a very dry spell for the first two months. The rainfall during the major growth period was adequate. Dry weather was experienced during the last six months of the crop. The cane was of good quality.

The rainfall at Pln. Rose Hall was below normal but was well distributed. The young spring experienced a very dry spell for the first six weeks but the rainfall during the major growth period was adequate. Dry weather prevailed during the last six months of the crop. The cane was of good quality.

The rainfall at Pln. Cane Grove was above the normal and was fairly well distributed. During the first two months the young spring experienced heavy weather, but the rain was fairly well distributed during the major growth period. During the last month of crop fairly heavy rain was experienced but the three preceding months were dry. The cane was of good quality.

The results obtained in these three first ratoon trials are presented in Table LXIV.

TABLE LXIV.

Effect of Superphosphate on First Ratoons.

Superphosphate, Cwt./acre.	Cane, Tons/acre.	Sucrose, % Cane.	Sucrose, Tons/acre.	Juice Purity.	Glucose Ratio.
Pln. Port Mourant, Field 13 Resource. D 625.					
Nil	29.52	15.28	4.48	85.5	10.58
2 cwt. plants and ratoons	29.68	14.49	4.50	83.8	12.70
4 cwt. „ „	29.17	15.44	4.42	85.6	10.31
3 cwt. plants only	26.99	15.21	4.09	86.8	9.04
6 cwt. „ „	27.73	15.41	4.21	87.1	10.38
Means	28.62	15.17	4.34	85.8	10.60
Pln. Rose Hall, Field 20 Tappinsburg. D 625.					
Nil	34.78	14.03	4.91	85.7	6.76
2 cwt. plants and ratoons	34.60	14.50	4.88	84.7	6.40
4 cwt. „ „	33.91	14.44	4.78	86.5	7.03
3 cwt. plants only	35.13	13.57	4.96	85.1	7.80
6 cwt. „ „	35.11	14.03	4.95	86.0	7.10
Means	34.71	14.11	4.90	85.6	7.02
Pln. Cane Grove Field 53 Melville. F.O.J. 2878.					
Nil	22.84	14.54	3.26	90.3	4.76
2 cwt. plants and ratoons	28.28	14.58	4.03	90.3	4.21
4 cwt. „ „	32.05	14.23	4.57	89.5	3.97
3 cwt. plants only	27.50	13.67	3.92	89.2	4.80
6 cwt. „ „	27.89	14.28	3.98	90.3	4.31
Means	27.71	14.26	3.95	89.9	4.41
S.E. of means	1.06	—	0.15	—	—
Significant Differences (20 : 1)	3.27	—	0.47	—	—

Phosphatic manures have had no definite effect in the trials at Pln. Port Mourant and Pln. Rose Hall. At Pln. Cane Grove, applications of phosphatic

manures have caused increases in tonnage but have had no definite effect on the sucrose content of the cane, the juice purity or the glucose ratio.

The results obtained in the Cane Grove experiment are considered in detail in Tables LXV and LXVI.

TABLE LXV.

Residual Effect of Phosphatic Fertilisers.

	First Ratoons.		Combined Results.
	Cane, Tons/acre.	Sucrose, Tons/acre.	Sucrose, Tons/acre.
Phosphate at planting	27.70	3.950	8.184
No phosphate at planting	22.84	3.257	6.389
Significant Differences (20 : 1)	2.82	0.402	—

TABLE LXVI.

Comparison of Effects of Applications of Phosphates to Plants only, and to Plants and First Ratoons.

Time of application.	First Ratoons.		Combined Results
	Cane, Tons/acre.	Sucrose, Tons/acre.	Sucrose, Tons/acre
At planting and ratoons	30.16	4.301	8.220
At planting only	27.70	3.950	8.184
S.E. of means	0.75	0.107	—
Significant Differences (20 : 1)	2.30	0.328	—

Conclusions:—Under the conditions of the experiment :—

(a) Phosphatic fertilisers applied to plant canes and first ratoons have a definite beneficial effect on the tonnage of cane.

(b) Phosphatic fertilisers applied to plant canes have a definite residual effect on the yield of cane in the first ratoon crop.

(c) Phosphatic fertilisers produce heavier yields when applied to plant canes and first ratoons than when applied to plant canes only.

SUB-SECTION D.—DISCUSSION AND SUMMARY.

NITROGENOUS FERTILISERS.

The two chains of latin squares designed to investigate the nitrogen requirements of the variety D. 625 on flooded frontland clay soils and on pegassy clay soils have yielded valuable information and have, in some measure, been responsible for the increased use of sulphate of ammonia in this Colony. During 1935, when a record sugar crop was obtained, the amount of sulphate of ammonia imported by the sugar estates amounted to 10,268 tons as compared with the previous highest recorded total of 8,294 tons in 1932 when the previous highest sugar crop was obtained.

The accurate determination of the optimum dressings of sulphate of ammonia is by no means an easy matter. In Java this question has been examined year by year with the aid of a large number of separate field experiments. It is unlikely that the small number of field experiments which the Department has established can do more than furnish pointers towards the optimum amounts, such pointers serving as a basis for large scale experiments by the plantation managers themselves.

The response to sulphate of ammonia is affected by weather conditions, by presence or absence of irrigation, by soil type and by cane variety. In consequence, the problem is not simple. The effects of climate and of soil type can be investigated, to some extent, by the establishment of a chain of widely distributed field trials. In some cases the results of these chains have indicated that weather conditions of the sugar belt do not greatly affect the nitrogen requirements of the sugar-cane whilst in other cases the results obtained with the individual trials are so varied that it is impossible to make a standard recommendation.

At the present time there are three important cane varieties planted on the sugar lands of the Colony and it will be convenient to consider their nitrogen requirements separately. D. 625, which still covers the largest acreage of any one variety, has naturally received more attention as regards its nitrogen requirements.

D. 625 on Flood-fallowed Frontland.

Experiments with *plant canes of D. 625* growing on flood-fallowed *frontland* have yielded variable results, due partly to the fact that the majority of them experienced the heavy floods of 1934. The combined results suggest that an application at the rate of 2 cwt. per acre is desirable though there are certain indications that under some conditions an application at the rate of 3 cwt. per acre is more profitable. Such a point should form the basis of large-scale experiments by the managers themselves.

There is definite evidence that *first ratoons* and *second ratoons of D. 625* growing on flood-fallowed *frontland* require applications of sulphate of ammonia at the rate of 4 cwt. per acre.

D. 625 on Pegassy Clay.

Experiments with *plant canes of D. 625* growing on *pegassy clay* give definite evidence that applications of sulphate of ammonia at the rate of 6 cwt. per acre are the most profitable. The propriety of applying heavy doses of sulphate of ammonia to these highly acidic soils is considered in a later paragraph.

There are definite indications that *first ratoons of D. 625* growing on *pegassy clay* require applications of 6 cwt. per acre of sulphate of ammonia.

The results of experiments with *second ratoons of D. 625* growing on *pegassy clay* are very variable. In two experiments dressings of sulphate of ammonia had no effect on the yield of sugar while in two other experiments there were indications that applications at the rate of 4 cwt. per acre were desirable. With present experience it is impossible to make any definite recommendations in this connection.

P.O.J. 2878 on Flood-fallowed Frontland.

Two experiments with *plant canes of P.O.J. 2878* on flood-fallowed *frontland* have given variable results. At one centre, where very heavy yields were obtained, dressings of sulphate of ammonia were without effect. At the other centre where more normal yields were obtained an application at the rate of 2 cwt. per acre appeared desirable. The matter is receiving further investigation. At the present time a recommendation of 2 cwt. per acre will serve as a basis for large scale tests by managers.

The results of two experiments with first ratoons of *P.O.J. 2878* on flood-fallowed *frontland* indicate that applications of sulphate of ammonia at the rate of 6 cwt. per acre are desirable.

No field experiments with second ratoons of P.O.J. 2878 have yet been completed.

P.O.J. 2878 on Pegassy Clay.

One experiment with *plant canes of P.O.J. 2878 on pegassy clay* indicates that a dressing of sulphate of ammonia at the rate of 8 cwt. per acre is desirable.

No experiments with ratoons of P.O.J. 2878 on *pegassy clay* have yet been completed.

Diamond 10 on Flood-fallowed Frontland.

No experiments with *plant canes of Diamond 10* on flood-fallowed *frontland* have yet been completed.

One experiment with *first ratoons of Diamond 10* on flood-fallowed *frontland* indicates that 2 cwt. per acre of sulphate of ammonia is desirable. The soil of this experimental area contained large amounts of soluble salts and it is possible

that the response of this variety to nitrogen was affected, to some extent, by the soil salinity. In view of the results obtained with other ratoons crops, the matter requires further investigation. No experiments with *second ratoons of Diamond 10* on flood-fallowed *frontland* have been executed.

Diamond 10 on Pegassy Clay.

One experiment with *plant canes of Diamond 10* on *pegassy clay* has been concluded. The results show that the most profitable application is at a rate of 6 cwt. per acre.

The results of one experiment with *first ratoons of Diamond 10* on *pegassy clay* show that applications at the rate of 2 cwt. per acre give definite increases. There are indications that applications at the rate of 4 cwt. per acre are more profitable. In view of results obtained with ratoons of other varieties on pegassy soils this question requires further investigation.

No experiments with *second ratoons of Diamond 10* on *pegassy clay* have yet been concluded.

Numerous experiments executed on pegassy soils have indicated that heavy applications of nitrogen are profitable. There remains a consideration of the best source of nitrogen. Pegassy soils are highly acidic and the degree of unsaturation may reach 90 per cent. The acidifying effects of sulphate of ammonia are well known and have, indeed, been demonstrated in the trials now under consideration. It is manifestly unwise to use large amounts of sulphate of ammonia on these soils. It is probable that the inferior yields already obtained on pegasse soils are, to some extent, due to the decomposition of the clay complex itself, with the production of water-soluble substances toxic to plants.

Some consideration has been given to this problem by the establishment of a chain of three experiments to compare the effects of sulphate of ammonia and calcium cyanamide on pegassy soil. It has been seen that applications of sulphate of ammonia give slightly heavier yields of cane than do applications of calcium cyanamide. Such a circumstance should not militate against the recommendation that calcium cyanamide be used on pegassy soils. There are, however, other reasons which seem to preclude the use of calcium cyanamide in this Colony. J. F. Williams, working in the Chemical Division of the Department of Agriculture, has investigated the changes occurring in calcium cyanamide stored locally. He noted the considerable transformation of calcium cyanamide into dicyanodiamide, the formation of crusts and the eventual loss of nitrogen as ammonia and concludes that, under the humid conditions obtaining in this Colony, it is doubtful whether calcium cyanamide would prove to be more economical than sulphate of ammonia unless it proved to be superior in field experiments.

At present heavy dressings of sulphate of ammonia to pegassy soils should always be accompanied by adequate applications of liming material. It is not always possible to ensure the thorough admixture of limestone with the soil. Under the circumstances a promising line of investigation would be the possibilities of Nitro-chalk.

Liming Materials.

During the last six years a number of trials with liming materials have been executed. Although the majority of cane soils are acidic yet no definite yield increases have been obtained on flood-fallowed frontland soils and only slight improvements have been noted on pegassy soils, most of which are highly unsaturated.

There is no doubt that the continued application of sulphate of ammonia to the sugar-cane soils of this Colony has resulted in an increase of soil acidity. Soil samples have been collected from each plot of a number of the latin squares receiving graded dressings of sulphate of ammonia and have been examined as regards their reaction and theoretical lime requirement. It has been possible to demonstrate a statistically significant increase in the theoretical lime requirement of soils receiving applications of sulphate of ammonia.

The loss of calcium carbonate per hundred parts of sulphate of ammonia is as follows:—

Clay soil	...	...	75 parts.
Pegasse soil	...	...	69 parts.

These estimates are considerably lower than those quoted by Russell (*Soil Conditions and Plant Growth*, 1932, p. 228) but they represent a very considerable loss of lime over a period of years.

In view of this tendency towards increased acidity it has been the practice to advise the application of small amounts of liming materials at planting. Such dressings are made in the form of an insurance rather than as a manurial application which will sensibly increase the yield of cane.

At the same time planters are interested in obtaining, if possible, some information regarding the effect of small dressings of liming materials on yield and also regarding the best source of lime and it was with these objects in view that the experiments described in sub-section B were undertaken.

It will be seen that there are slight indications that small dressings of liming materials have a beneficial effect on the plant cane yields but such increases might well have occurred by pure chance.

The flood-fallowing trials, reported in a later section, have given indications that ground limestone applied before submergence is more effective than when applied just prior to planting. The trials considered in this sub-section are con-

cerned with dressings of liming materials made just before planting. It would seem advisable to substitute a series of trials to investigate the effects of applications of liming materials before flooding.

The field trials so far conducted have indicated that there is no preference as regards pulverised limestone or slaked lime as a source of lime. At present it is mainly a matter of cost.

Phosphatic Manures.

The two chains of three 5 x 5 latin squares dealing with the application of phosphatic fertilisers have given interesting results.

Samples of soil withdrawn from the experimental areas just prior to the commencement of the trials were examined as regards their content of available phosphate by two methods, the 1% citric acid method and the Truog method. The values obtained for available phosphate are compared in Table LXVII with the results of field applications of phosphatic fertilisers.

TABLE LXVII.

Soil Content of Available Phosphate, p.p.m., in Relation to Response to Fertiliser

Situation.	1% Citric acid method.		Truog method.		Result of Field Experiment.
	Topsoil.	Subsoil.	Topsoil.	Subsoil.	
Pln. Blairmont, 15 Hp.	133	48	35	19	No effect on tonnage. Improved quality.
Pln. Rose Hall, 19, L. 20.	42	36	14	60	Indefinite.
Pln. Rose Hall, 20 T.	31	23	18	20	No effect.
Pln. Cane Grove, 51 M.	44	17	10	10	Definite increase.
Pln. Cane Grove, 53 M.	26	8	10	10	Definite increase.
Pln. Port Mourant, 13 R.	75	23	18	21	No effect.

It appears that, as far as the effect of phosphatic fertilisers on cane tonnage is concerned, the Truog method gives a better indication of the phosphate requirements of a soil than does the 1% citric acid method of extraction.

As regards the effect of phosphatic fertilisers on the quality of cane the position is obscure. The experimental area in Field 15 Hp., Plu. Blairmont, gave the heaviest tonnage of plant cane of the six experiments under consideration and the soil of the area yielded the largest amounts of available phosphate, yet only in this experiment did phosphatic manures have a definite effect on the quality of the cane and juice.

The results of the trials tend to confirm the suitability of the limit of available phosphate content (16 p.p.m. by Truog method) used in advisory work in this Colony.

The results reported in Table XLIX of *Sugar Bulletin* No. 4 indicated that Nicifos, Type B, is preferable, as a source of phosphate, to superphosphate, basic slag or Preciphos. It is surprising that basic slag was not more effective in Field 51 Melville, Pln. Cane Grove, since the degrees of unsaturation for topsoil and subsoil were 80.6 % and 76.1 % respectively. It is probable that basic slag would compare more favourably over a number of years.

Consideration of the results of two crops in Field 53 Melville, Pln. Cane Grove, indicates that the heaviest yields are obtained when applications at the rate of 4 cwt. per acre of superphosphate are made both to plant canes and to first ratoons. In view, however, of the residual effect of dressings at planting on the yield of the first ratoons it is probable that it is economically sound to apply phosphatic fertilisers to the plant canes only.

While certain indications of much value have emerged from these trials it is apparent that the question of phosphatic manuring still requires further investigations. In this connection the estates themselves should be able to obtain a considerable amount of information by establishing demonstration areas in certain fields. The matter is of considerable importance since there are large areas of sugar-cane lands, particularly in Berbice, where the soil content of available phosphate is below the accepted limit.

SUMMARY.

In this brief summary the recommendations which are made with confidence are printed in heavy type while those of a tentative nature appear in ordinary type.

Nitrogenous Fertilisers.

Variety D. 625 on Flood-fallowed Frontland.

Plant canes should receive 2-3 cwt. per acre of sulphate of ammonia.

FIRST AND SECOND RATOONS SHOULD RECEIVE 4 CWT. PER ACRE OF SULPHATE OF AMMONIA.

Variety D. 625 Pegassy Clay.

PLANT CANES AND FIRST RATOONS SHOULD RECEIVE 6 CWT. PER ACRE OF SULPHATE OF AMMONIA. IT IS ESSENTIAL THAT SUCH DRESSINGS SHOULD BE

ACCOMPANIED BY APPLICATIONS OF GROUND LIMESTONE AT THE RATE OF 1 TON PER ACRE.

No definite recommendation can be made regarding the nitrogen requirements of the second ratoon crop.

Variety P.O.J. 2878 on Flood-fallowed Frontland.

Plant canes should receive 2 cwt. per acre of sulphate of ammonia.

First ratoons should receive 6 cwt. per acre of sulphate of ammonia.

No information is available regarding the nitrogen requirements of the second ratoon crop. It seems safe to assume that 1 cwt. per acre of sulphate of ammonia may be applied.

Variety P.O.J. 2878 on Pegassy Clay.

Plant canes should receive 8 cwt. per acre of sulphate of ammonia accompanied by an adequate application of ground limestone.

No definite recommendations can be made regarding the nitrogen requirements of the ratoons.

Variety Diamond 10 on Flood-fallowed Frontland.

No information is available regarding the nitrogen requirements of plant canes. It seems safe to assume that at least 2 cwt. per acre of sulphate of ammonia will be required.

One experiment indicates that first ratoons require 2 cwt. per acre of sulphate of ammonia. Further investigation is required.

No recommendations can be made regarding the nitrogen requirements of the second ratoon crop.

Variety Diamond 10 on Pegassy Clay.

Plant canes require 6 cwt. per acre of sulphate of ammonia accompanied by adequate applications of ground limestone.

One experiment shows that first ratoons require 2 cwt. per acre of sulphate of ammonia but indicates that heavier dressings are more profitable. Further investigation is necessary.

No recommendation can be made regarding the nitrogen requirements of the second ratoon crop.

CALCIUM CYANAMIDE APPLIED TO PEGASSY CLAYS IS NOT QUITE SO EFFECTIVE AS SULPHATE OF AMMONIA. It is probably that there would be some difficulty in storing calcium cyanamide in this Colony.

Liming Materials.

BOTH FRONTLANDS AND PEGASSY CLAYS SHOULD RECEIVE 1 TON OF LIMESTONE AT PLANTING. The application may be reduced if basic slag is also applied.

Phosphatic Manures.

No definite recommendations can be made in this connection. Soils containing less than 16 p.p.m. of available phosphate (Truog Method) will probably respond to applications of phosphates. It seems economically sound to apply phosphates at planting only. Consideration should be given to Nicifos B and basic slag in preference to superphosphate.

FLOOD-FALLOWING TRIALS.

A general description of the objects and a record of the plant cane results of two field trials concerned with flood-fallowing were given in *Sugar Bulletin* No. 4, pp 96–104. The present discussion deals with the results obtained from the first ratoon crops of the Port Mourant experiments. The two trials established at Pln. Lusignan were severely damaged by floods. They are to be recommenced shortly and will follow the same general design as the Port Mourant experiments.

Flood-Fallowing Experiment in Field No. 28 Tain Windward, Pln. Port Mourant.

The treatments were as follows :—

(a) Flooded to a minimum depth of 12 inches for six months ;
(b) Similar to (a) but with five tons molasses per acre added to flood water ;
(c) Similar to (a) but sown with floating vegetation ;
(d) Partially flooded (depth of 3 in.) for six months and semi-aquatic weeds allowed to grow spontaneously.

The first ratoons were reaped September 14th, 1935.

The rainfall at this centre was above the normal but was not well distributed. For the first five months of the crop dry weather was experienced and the heavy rains of February came late in the major growing period. During the last four months of the crop the rains were well above the average. The cane was of fair quality.

The results of the first ratoon crop are presented in Table LXXVI together with the combined results for the two crops.

Table LXVII.

Residual Effects of Various Types of Flood-Fallow (First Ratoons, D. 625).

Treatment.	Cane, Tons/acre.	Sucrose, % Cane.	Juice Purity.	Glucose Ratio.	Sucrose, Tons/acre.	Sucrose, Tons/acre. Two crops.
(a)	29.98	13.75	88.4	8.39	4.056	8.641
(b)	35.25	13.36	86.8	9.85	4.769	10.188
(c)	35.20	13.48	87.8	8.74	4.763	9.411
(d)	29.78	13.53	86.9	9.81	4.029	8.719
Means	32.56	13.53	87.5	9.20	4.404	9.240
S.E. of means	1.19	—	—	—	0.161	—
Significant Differences (20:1)	4.12	—	—	—	0.557	—

'Z' value obtained for effect of treatment on tonnage of cane..... = 0.9573
'Z' value required for P = 0.05..... = 0.7798

Conclusions :—Under the conditions of the experiment :—

(a) Treatments had a marked effect on the yield of cane in the first ratoon crop but were without effect on the sucrose content, the glucose ratio and the juice purity.

(b) In the first ratoon, as in the plant cane crop, a bare water fallowing to a minimum depth of twelve inches gave no heavier yield than a partial flooding to a depth of three inches.

(c) In the first ratoon crop the addition of molasses to the flooding water and the encouragement of floating vegetation are equally effective in giving heavier yields than bare fallowing to twelve inches or partial flooding to a depth of three inches.

The results obtained for the two crops are graphically represented in Figure XXXIX and are discussed in later paragraphs.

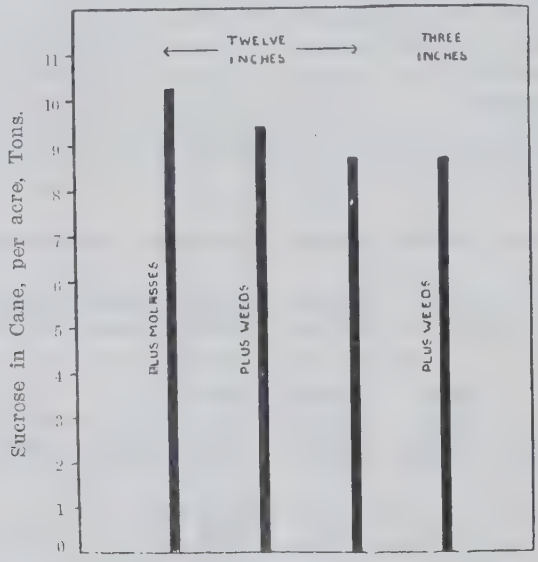

FIG. XXXIX.

Effect of Various Types of Flood-Fallow (D. 625 : Plant Canes and First Ratons).

Flood-Fallowing Experiment in Field No. 28 Tain Leeward, Pln. Port Mourant.

The details of the treatments and layout of this experiment have been previously described but certain details are repeated for convenience.

Treatments:—

(a) Grass-fallowed for 12 months;
(b) Grass-fallowed for 8 months, flood-fallowed for 4 months;
(c) Grass-fallowed for 6 months, flood-fallowed for 6 months;
(d) Not grass-fallowed, flood-fallowed for 12 months. Half plot treatments included the application of the ground limestone before flooding and after flooding.

The first ratoons were reaped on February 27th, 1936.

The rainfall through the crop was slightly above the normal and was well distributed. The young spring experienced a month of dry weather but rainfall was adequate during the major growth period. Very dry weather was experienced during the last four months of the crop. The cane was of good quality.

The treatments had no effect on the sucrose content of the cane, the glucose ratio or the juice purity. The average values for these analytical figures are:—

Percentage of sucrose in cane	...	...	15.52
Juice purity	...	...	86.31
Glucose ratio	...	...	8.92

The yields of sucrose per acre for the first ratoon crop and the totals for the two crops are given in Table LXIX and presented graphically in Figure XL.

Table LXIX.

Effects of Duration of Flooding and Time of Application of Limestone on Yield of Sucrose, Tons per Acre.

Duration of Flooding.	1 Ton Ground Limestone per Acre.					
	Before Flooding.		After Flooding.		Means.	
	1st Ratoons.	Total, 2 Crops.	1st Ratoons.	Total, 2 Crops.	1st Ratoons.	Total, 2 Crops.
No flooding	3.897	8.047	4.384	9.625	4.140	8.836
4 months	5.733	10.826	5.572	10.504	5.652	10.665
6 months	6.604	12.329	6.071	11.676	6.336	12.002
12 months	6.411	12.698	5.877	12.235	6.144	12.466
Means	5.661	10.975	5.476	11.010	5.568	10.992

Table LXX presents the first ratoon yields for the major issues involved in the trial.

TABLE LXX.

Effect of Limestone before or after Flooding, in the presence and absence of Flood-Fallowing, on the Yield on Sucrose, Tons per Acre.

	No Flooding.	Significant Difference (20 : 1).	Flooding.
Limestone before	3.897	0.582	26.49
Limestone after	4.384		5.840
Significant Differences (20: 1)	0.712		0.411
Means	4.140		6.044

'Z' value obtained for effect of flooding on yield of cane..... = 1.6174
'Z' value required for P = 0.01..... = 1.3103
'Z' value obtained for interaction of time of application and flooding..... = 0.9015
'Z' value required for P = 0.05..... = 0.8163

Table LXXI presents a similar arrangement of the combined results of the plant cane and first ratoon crops.

TABLE LXXI.

Effects of Limestone before and after Flooding in presence and absence of Flooding on the Yield of Sucrose, Tons per Acre, (Totals of two crops).

	No Flooding.	Flooding.
Limestone before	8.047	11.951
Limestone after	9.625	11.472
Means	8.836	11.712

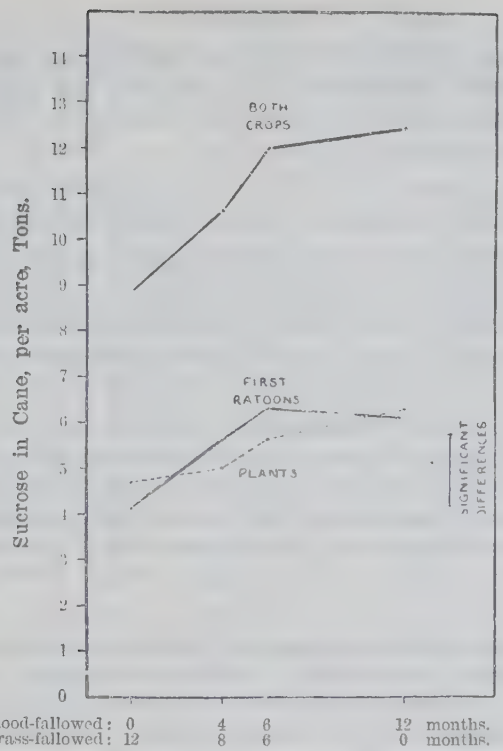

FIG. XL.

Effect of Duration of Flood-Fallow.

Conclusions :—Under the conditions of the experiment :—

(a) Flood-fallowing does not affect the sucrose content, the juice purity or the glucose ratio of the first ratoon crop nor does the time of application of limestone (*i.e.*, before flood or grass fallow, or just before planting) affect these factors.

(b) Although the different durations of flooding appear to have an effect on the yield of cane yet the experiment possesses so few replicates that the differences cannot be accepted as statistically significant.

(c) Applications of limestone before flooding give an almost statistically significant increase in the first ratoon crop over applications of limestone after flooding.

(d) There are indications, not statistically significant, that the grass-fallow plots limed just before planting outyield, in the first ratoons, grass-fallow plots limed at the commencement of fallowing.

Discussion.

Few of the results obtained in these two trials can be considered statistically significant. Duplicate experiments were originally laid down with a view to combining the results of pairs of trials. Unfortunately the trials at Pln. Lusignan were vitiated by floods.

The indications obtained at Pln. Port Mourant are of such interest that it is essential that similar experiments be laid down at other plantations.

Judging from the results of two crops it appears that a partial flooding to a depth of three inches is just as effective as a total submergence to a minimun depth of twelve inches. Such a result is interesting for it has been felt in some quarters that deeper flooding gives a heavier yield and, by the suppression of undesirable weeds. renders subsequent planting operations less costly.

The addition of final molasses at the rate of five tons per acre to the flooding water has resulted, in two crops, in an increased yield of 1.547 tons sucrose per acre which, assuming the value and cost of application of the molasses to be three cents per gallon, represents a fair profit. This treatment was included at a time when the future of the molasses market was uncertain and the results suggest a possible outlet for final molasses. These findings also require confirmation.

The collection of floating vegetation from the trenches and its introduction to flooded fields appears to be worthy of further investigation. Although such a procedure showed no definite improvement in the plant cane crop yet a statistically significant increase of 0.707 tons of sucrose per acre (0.59 tons of 96° sugar) was obtained in the first ratoon crop. Certain padi manurial trials have also shown that applications of organic matter to the frontland clays are not immediately effective but require dressings of artificial fertilisers at a later date if yield increases are to be obtained.

The second flooding trial indicates the very definite advantages of flood-fallowing which has, in two crops, been responsible for an increased yield of 33 per cent.

The experiment was not sufficiently precise to distinguish statistically between the effects of flood-fallowing for four, six or twelve months. The combined results suggest that a twelve-month flooding is slightly superior to a six-month flooding and that both these periods are much more effective than a flooding of four months.

While the yield of sugar is the principal standard by which the value of the various flooding procedures is assessed, other factors, such as the cost of maintaining a certain depth of water, the length of time that an area is out of cultivation and the suppression of undesirable weeds which are probably more thoroughly eliminated by deeper and more prolonged flooding, must also be considered.

From the combined results of the second trial it appears to be preferable to apply limestone before flooding rather than after flooding. Such a procedure would have the added advantage that sulphate of ammonia could be applied to the cane at an early stage.

The two trials discussed have raised many interesting points which require further confirmation by means of similar experiments.

There are other matters which require investigation. Laboratory work has shown that flood-fallowed soils contain considerably larger amounts of 'available' iron than do unflooded soils and an explanation of the beneficial effects of flooding has been put forward which involves the physical effect of iron on the tilth of the soil. In order to confirm this explanation it is necessary to investigate the possible direct manurial effects of applications of iron salts to sugar-cane.

Another point which should form the basis of field experimentation is the possible interaction of ploughing and duration of flood-fallowing. One estate regularly ploughs flood-fallowed land before planting. It is possible that shorter periods of submergence followed by ploughing would be just as effective as longer periods of simple flooding. Such a point is worthy of consideration, especially in East and West Demerara where shortage of land precludes long periods of fallow.

The writers are indebted to J. C. Gibson, Esq., and R. B. Hunter, Esq., who read draft copies of this section and suggested several improvements.

APPENDIX I.—RAINFALL DATA.

RAINFALL AT SOPHIA EXPERIMENT STATION.

Month.		Rainfall 1934-1936, inches.	Average Rainfall 1921-1935, inches.	Excess or Deficit During Growth of the Various Experiments.									
				Field 3 East, A,B.	Field 12 East.	Fields 1 East and 1 West.	Fields 5, 7 & 8 West.	Field 9 West.	Field 12 West.	Field 10 West.	Field 5 East A,B,C,D.	Field 16 West.	Fields 5 East E. 6 West A,B and 13 West.
May	1934	3.42	11 49	— 8.07									
June		9.35	14.12	— 4.77									
July		10.56	10.55	+ .01									
August		3.86	8.52	— 4.66									
September		1.50	2.81	— 1.31	— 1.31								
October		4.78	3.96	+ .82	+ .82	+ .82							
November		4.98	5.89	— .91	— .91	— .91	— .91						
December		6.04	14.11	— 8.07	— 8.07	— 8.07	— 8.07	— 8.07					
January	1935	5.91	8.69	— 2.78	— 2.78	— 2.78	— 2.78	— 2.78	— 2.78				
February		11.15	3.97	+ 7.18	+ 7.18	+ 7.18	+ 7.18	+ 7.18	+ 7.18	+ 7.18			
March		3.80	4.02	— .22	— .22	— .22	— .22	— .22	— .22	— .22			
April		1.46	4.64	— 3.18	— 3.18	— 3.18	— 3.18	— 3.18	— 3.18	— 3.18	— 3.18	— 3.18	
May		12.71	11.49	+ 1.22	+ 1.22	+ 1.22	+ 1.22	+ 1.22	+ 1.22	+ 1.22	+ 1.22	+ 1.22	+ 1.22
June		14.00	14.12	— .12	— .12	— .12	— .12	— .12	— .12	— .12	— .12	— .12	— .12
July		8.94	10.55	— 1.61	— 1.61	— 1.61	— 1.61	— 1.61	— 1.61	— 1.61	— 1.61	— 1.61	— 1.61
August		11.71	8.52	+ 3.19	+ 3.19	+ 3.19	+ 3.19	+ 3.19	+ 3.19	+ 3.19	+ 3.19	+ 3.19	+ 3.19
September		5.30	2.81	+ 2.49	+ 2.49	+ 2.49	+ 2.49	+ 2.49	+ 2.49	+ 2.49	+ 2.49	+ 2.49	+ 2.49
October		4.22	3.96	—20.79	— 3.30	— 1.99	+ .26	+ .26	+ .26	+ .26	+ .26	+ .26	+ .26
November		4.34	5.89				— 1.54	— 1.54	— 1.54	— 1.54	— 1.54	— 1.54	— 1.54
December		4.36	14.11				— 4.09	— 3.18	— 9.75	— 9.75	— 9.75	— 9.75	— 9.75
January	1936	6.51	8.69						— 2.18	— 2.18	— 2.18	— 2.18	— 2.18
February		2.38	3.97						— 1.59	— 1.59	— 1.59	— 1.59	— 1.59
March		9.43	4.02						+ 5.41	+ 5.41	+ 5.41	+ 5.41	+ 5.41
April		14.40	4 64						— 3.22	+ 9.76	+ 9.76	— 7.40	+ 9.76
										+ 9.32	+ 2.36		+ 5.54

RAINFALL AT PLANTATION SKELDON.

Month.	Rainfall 1934—1935, Inches.	Average Rainfall 1906—1935, Inches.	Excess or Deficit during Growth of the Various Experiments.	
			Field 8 S.	Fields 7 E.M. & 8 E.M.
September 1934	4.53	2.76	+ 1.77	
October	5.92	3.21	+ 2.71	+ 2.71
November	3.42	3.81	− .39	− .39
December	3.91	7.15	− 3.24	− 3.24
January 1935	4.83	6.93	− 2.10	− 2.10
February	14.24	4.76	+ 9.48	+ 9.48
March	1.88	5.31	− 3.43	− 3.43
April	.95	5.97	− 5.02	− 5.02
May	6.80	9.93	− 3.13	− 3.13
June	14.91	10.56	+ 4.35	+ 4.35
July	7.67	9.33	− 1.66	− 1.66
August	10.70	6.25	+ 4.45	+ 4.45
September	2.45	2.76	− .31	− .31
			+ 3.48	+ 1.71

RAINFALL AT PLANTATION PORT MOURANT.

Month.	Rainfall 1934—1936, Inches.	Average Rainfall 1880—1935, Inches.	Excess or Deficit during Growth of the Various Experiments.						
			Field 28 T.W.	Field 11 T.L.	Field 13 R.	Field 4 H.E.	Field 28 T.L.	Field 28 A.E.	Field 15 A.O.L.
September 1934	1.01	1.82	− .81						
October	3.33	1.75	+ 1.58	+ 1.58					
November	4.18	3.36	+ .82	+ .82					
December	5.78	7.66	− 1.88	− 1.88					
January 1935	3.45	6.69	− 3.24	− 3.24					
February	11.16	5.04	+ 6.12	+ 6.12					
March	1.36	4.91	− 3.55	− 3.55	− 3.55				
April	1.08	5.41	− 4.33	− 4.33	− 4.33	− 4.33	− 4.33	− 4.33	
May	9.92	8.96	+ .96	+ .96	+ .96	+ .96	+ .96	+ .96	+ .96
June	17.12	9.10	+ 8.02	+ 8.02	+ 8.02	+ 8.02	+ 8.02	+ 8.02	+ 8.02
July	11.94	7.87	+ 4.07	+ 4.07	+ 4.07	+ 4.07	+ 4.07	+ 4.07	+ 4.07
August	8.35	5.21	+ 3.14	+ 3.14	+ 3.14	+ 3.14	+ 3.14	+ 3.14	+ 3.14
September	2.86	1.82	+10.90	+ 1.04	+ 1.04	+ 1.04	+ 1.04	+ 1.04	+ 1.04
October	5.24	1.75		+ 3.49	+ 3.49	+ 3.49	+ 3.49	+ 3.49	+ 3.49
November	1.15	3.36		+16.24	− 2.21	− 2.21	− 2.21	− 2.21	− 2.21
December	2.51	7.66			− 5.15	− 5.15	− 5.15	− 5.15	− 5.15
January 1936	2.93	6.69			− 3.76	− 3.76	− 3.76	− 3.76	− 3.76
February	1.65	5.04			− 3.39	+ 5.27	− 3.39	− 3.39	− 3.39
March	14.30	4.91			− 1.67		+ 1.88	+ 9.39	+ 9.39
								+11.27	+15.60

RAINFALL AT PLANTATION ALBION.

Month.		Rainfall 1934—1935, Inches.	Average Rainfall 1865—1935, Inches.	Excess or Deficit during Growth of the Experiment. Field 31 K.
September	1934	1.01	2.02	− 1.01
October		3.62	1.81	+ 1.81
November		3.87	3.62	+ .25
December		5.59	8.06	− 2.47
January	1935	3.99	6.77	− 2.78
February		11.01	5.02	+ 5.99
March		1.86	5.46	− 3.60
April		1.10	6.18	− 5.08
May		12.17	9.15	+ 3.02
June		16.54	8.90	+ 7.64
July		11.02	8.27	+ 2.75
August		8.04	5.54	+ 2.50
September		2.36	2.02	+ .34
				+ 9.36

RAINFALL AT PLANTATION ROSE HALL.

Month.		Rainfall 1935—1936, Inches.	Average Rainfall 1907—1935, Inches.	Excess or Deficit during Growth of the Various Experiments. Fields 20 T. & 30 R.H.
March	1935	1.17	5.80	− 4.63
April		1.26	5.50	− 4.24
May		11.30	10.65	+ .65
June		18.81	10.78	+ 8.03
July		12.37	10.18	+ 2.19
August		8.80	6.16	+ 2.64
September		2.84	2.22	+ .62
October		4.47	2.64	+ 1.83
November		2.20	3.34	− 1.14
December		4.13	9.13	− 5.00
January	1936	3.87	8.15	− 4.28
February		1.40	6.27	− 4.87
				− 8.20

RAINFALL AT PLANTATION BLAIRMONT.

Month.		Rainfall 1934-1935, Inches.	Average Rainfall 1897-1935, Inches.	Excess or Deficit during Growth of the Various Experiments.			
				Field 71 B.L.	Field 18 R.	Field 4 H.	Field 24 Rp.
August	1934	4.65	6.55	− 1.90			
September		2.28	2.24	+ .04			
October		5.06	2.44	+ 2.62	+ 2.62		
November		2.72	3.44	− .72	− .72	− .72	
December		5.42	9.30	− 3.88	− 3.88	− 3.88	− 3.88
January	1935	3.40	7.81	− 4.41	− 4.41	− 4.41	− 4.41
February		14.06	5.07	+ 8.99	+ 8.99	+ 8.99	+ 8.99
March		2.67	6.25	− 3.58	− 3.58	− 3.58	− 3.58
April		1.67	6.64	− 4.97	− 4.97	− 4.97	− 4.97
May		11.24	11.31	− .07	− .07	− .07	− .07
June		16.52	11.50	+ 5.02	+ 5.02	+ 5.02	+ 5.02
July		10.74	9.71	+ 1.03	+ 1.03	+ 1.03	+ 1.03
August		15.72	6.55	+ 9.17	+ 9.17	+ 9.17	+ 9.17
September		5.37	2.24	+ 3.13	+ 3.13	+ 3.13	+ 3.13
October		5.97	2.44	+10.47	+ 3.53	+ 3.53	+ 3.53
November		1.16	3.44		+15.86	+13.24	− 2.28
December		4.11	9.30				− 5.19
							+ 6.49

RAINFALL AT PLANTATION CANE GROVE.

Month.		Rainfall 1935-1936, Inches.	Average Rainfall 1916-1935, Inches.	Excess or Deficit during Growth of the Various Experiments.	
				Field 17 P.	Fields 53 M. & 63 M.
February	1935	8.62	3.95	+ 4.67	
March		2.77	3.67	− .90	
April		1.63	5.54	− 3.91	
May		10.21	11.21	− 1.00	− 1.00
June		16.93	11.63	+ 5.30	+ 5.30
July		10.24	10.00	+ .24	+ .24
August		8.73	6.95	+ 1.78	+ 1.78
September		9.29	2.47	+ 6.82	+ 6.82
October		5.18	3.56	+ 1.62	+ 1.62
November		5.83	5.56	+ .27	+ .27
December		4.20	11.44	− 7.24	− 7.24
January	1936	4.98	7.81	− 2.83	− 2.83
February		2.83	3.95	− 1.12	− 1.12
March		9.53	3.67	+ 5.86	+ 5.86
				+ 9.56	+ 9.70

RAINFALL AT PLANTATON ENMORE.

Month.	Rainfall 1934—1936, Inches.	Average Rainfall 1913—1935, Inches.	Excess or Deficit during Growth of the Various Experiments.		
			Field 16 E.P.	Field 8 B.A.	Field 15 B.A.
August 1934	3.63	6.26	− 2.63		
September	.81	2.41	− 1.60		
October	4.83	3.09	+ 1.74		
November	3.81	5.92	− 2.11		
December	6.26	11.10	− 4.84		
January 1935	3.03	8.25	− 5.22		
February	9.22	4.16	+ 5.06	+ 5.06	+ 5.06
March	4.17	4.04	+ .13	+ .13	+ .13
April	1.29	5.24	− 3.95	− 3.95	− 3.95
May	11.26	11.00	+ .26	+ .26	+ .26
June	15.10	11.79	+ 3.31	+ 3.31	+ 3.31
July	8.94	9.10	− .16	− .16	− .16
August	5.81	6.26	− .45	− .45	− .45
September	6.28	2.41	+ 3.87	+ 3.87	+ 3.87
October	4.81	3.09	− 6.59	+ 1.72	+ 1.72
November	5.30	5.92		− .62	− .62
December	4.67	11.10		− 6.43	− 6.43
January 1936	5.60	8.25		− 2.65	− 2.65
February	2.79	4.16		− 1.37	− 1.37
March	11.90	4.04		− 1.28	+ 7.86
					+ 6.58

RAINFALL AT PLANTATION LA BONNE INTENTION.

Month.	Rainfall 1935—1936, Inches.	Average Rainfall 1916—1935, Inches.	Excess or Deficit during Growth of the Experiment.
			Field 36 L.R.
February 1935	8.38	4.00	+ 4.38
March	3.83	4.41	− .58
April	1.34	4.87	− 3.53
May	11.89	11.14	+ .75
June	14.62	12.37	+ 2.25
July	7.10	9.59	− 2.49
August	8.00	7.26	+ .74
September	5.02	2.42	+ 2.60
October	5.70	3.37	+ 2.33
November	4.69	6.72	− 2.03
December	3.70	11.91	− 8.21
January 1936	5.42	8.77	− 3.35
February	2.79	4.00	− 1.21
March	9.68	4.41	+ 5.27
April	11.88	4.87	+ 7.01
			+ 3.93

RAINFALL AT PLANTATION LUSIGNAN.

Month.	Rainfall 1934—1936, Inches.	Average Rainfall 1887—1935, Inches.	Excess or Deficit during Growth of the Various Experiments.				
			Field 26 W.	Field H.	Field 40 W.	Field 4 E.	Field 85 M.R.
September 1934	.93	2.21	− 1.28				
October	7.12	2.40	+ 4.72	+ 4.72			
November	4.34	4.95	− .61	− .61			
December	6.62	10.73	− 4.11	− 4.11			
January 1935	4.11	8.08	− 3.97	− 3.97	− 3.97		
February	7.55	5.10	+ 2.45	+ 2.45	+ 2.45		
March	3.40	5.95	− 2.55	− 2.55	− 2.55	− 2.55	
April	1.56	6.04	− 4.48	− 4.48	− 4.48	− 4.48	
May	10.84	10.61	+ .23	+ .23	+ .23	+ .23	+ .23
June	15.11	11.52	+ 3.59	+ 3.59	+ 3.59	+ 3.59	+ 3.59
July	7.60	9.21	− 1.61	− 1.61	− 1.61	− 1.61	− 1.61
August	7.10	5.55	− 7.62	+ 1.55	+ 1.55	+ 1.55	+ 1.55
September	5.21	2.21		+ 3.00	+ 3.00	+ 3.00	+ 3.00
October	6.16	2.40		− 1.79	+ 3.76	+ 3.76	+ 3.76
November	5.21	4.95			+ .26	+ .26	+ .26
December	4.28	10.73			− 6.45	− 6.45	− 6.45
January 1936	5.66	8.08			− 2.42	− 2.42	− 2.42
February	2.82	5.10			− 6.64	− 2.28	− 2.28
March	12.47	5.95				− 7.40	+ 6.52
							+ 6.15

RAINFALL AT PLANTATION OGLE.

Month.		Rainfall 1934—1935, Inches.	Average Rainfall 1906—1935, Inches.	Excess or Deficit during Growth of the Various Experiments.	
				Field 45 O.	Field 61 O.
August	1934	5.36	7.19	− 1.83	
September		2.09	2.32	− .23	
October		5.11	3.37	+ 1.74	+ 1.74
November		3.96	5.21	− 1.25	− 1.25
December		6.18	10.58	− 4.40	− 4.40
January	1935	4.95	7.86	− 2.91	− 2.91
February		10.77	4.59	+ 6.18	+ 6.18
March		4.90	5.27	− .37	− .37
April		1.92	5.49	− 3.57	− 3.57
May		12.24	11.19	+ 1.05	+ 1.05
June		17.95	11.13	+ 6.82	+ 6.82
July		8.19	9.66	− 1.47	− 1.47
August		11.38	7.19	+ 4.19	+ 4.19
September		4.25	2.32	+ 1.93	+ 1.93
October		3.41	3.37	+ .04	+ 7.94
				+ 5.92	

RAINFALL AT PLANTATION DIAMOND.

Month.		Rainfall 1934—1935, Inches.	Average Rainfall 1890—1935, Inches.	Excess or Deficit during Growth of the Experiment. Field 90 G.D.
October	1934	12.31	4.02	+ 8.29
November		6.06	5.96	+ .10
December		5.91	12.10	— 6.19
January	1935	3.59	9.61	— 6.02
February		8.71	5.98	+ 2.73
March		3.85	7.50	— 3.65
April		1.88	7.17	— 5.29
May		11.40	12.73	— 1.33
June		23.61	14.10	+ 9.51
July		12.02	11.29	+ .73
August		11.39	8.04	+ 3.35
September		4.09	3.73	+ .36
				+ 2.59

RAINFALL AT PLANTATION WALES.

Month.		Rainfall 1935–1936, Inches.	Average Rainfall 1906–1935, Inches.	Excess or Deficit during Growth of the Various Experiments. Field 9 C.	Field 45 B.	Field 4 B.
March	1935	4.43	6.88	— 2.45	— 2.45	
April		1.54	6.68	— 5.14	— 5.14	— 5.14
May		10.83	13.73	— 2.90	— 2.90	— 2.90
June		25.24	14.54	+10.70	+10.70	+10.70
July		10.52	11.59	— 1.07	— 1.07	— 1.07
August		8.99	8.33	+ .66	+ .66	+ .66
September		4.21	3.71	+ .50	+ .50	+ .50
October		4.81	4.31	+ .50	+ .50	+ .50
November		3.45	6.33	— 2 88	— 2.88	— 2.88
December		4.46	12.53	— 8.07	— 8.07	— 8.07
January	1936	7.54	9.44	— 1.90	— 1.90	— 1.90
February		3.21	5.39	— 2.18	— 2.18	— 9.60
March		11.71	6.88	—14.23	+ 4.83	
					— 9.40	

RAINFALL AT PLANTATION VERSAILLES.

Month.		Rainfall 1935—1936, Inches.	Average Rainfall 1916—1935, Inches.	Excess or Deficit during Growth of the Experiment. Field 31 R.D.Z.
March	1935	3.56	4.60	— 1.04
April		1.21	4.62	— 3.41
May		9.90	10.88	— .98
June		14.93	13.08	+ 1.85
July		8.01	10.05	— 2.04
August		12.87	8.47	+ 4.40
September		5.59	3.22	+ 2.37
October		3.08	3.12	— .04
November		2.04	5.87	— 3.83
December		5.21	12.10	— 6.89
January	1936	5.65	8.56	— 2.91
February		2.45	3.82	— 1.37
				—13.89

RAINFALL AT PLANTATION LEONORA.

Month.		Rainfall 1934—1936, Inches.	Average Rainfall 1906—1935, Inches.	Excess or Deficit during Growth of the Experiment. Field N.E.A.C.I.
October	1934	8.12	3.63	+ 4.49
November		4.46	5.94	— 1.48
December		5.13	11.51	— 6.38
January	1935	2.72	9.48	— 6.76
February		11.76	4.77	+ 6.99
March		3.86	5.74	— 1.88
April		1.21	5.26	— 4.05
May		11.70	12.94	— 1.24
June		16.55	13.11	+ 3.44
July		9.91	11.01	— 1.10
August		8.94	7.61	+ 1.33
September		4.16	3.09	+ 1.07
October		8.39	3.63	+ 4.76
November		4.70	5.94	— 1.24
December		4.53	11.51	— 6.98
January	1936	8.29	9.48	— 1.19
				—10.22

Rainfall at Plantation Uitvlugt.

Month.		Rainfall 1934-1936, Inches.	Average Rainfall 1916-1935, Inches.	Excess or Deficit during Growth of the Various Experiments.					
				Field 33 E.	Field 90 M.Z.	Field 72 DeK.	Fields 13 E and 94 M.Z.	Field 42 W.	Field 14 Z.
March	1934	3.30	4.68	- 1.38					
April		2.86	5.48	- 2.62					
May		4.57	13.24	- 8.67					
June		12.00	14.48	- 2.48					
July		12.68	11.77	+ .91					
August		4.66	7.91	- 3.25					
September		2.39	3.37	- .98	- .98				
October		11.73	4.72	+ 7.01	+ 7.01				
November		5.74	7.46	- 1.72	- 1.72	- 1.72			
December		7.35	13.46	- 6.11	- 6.11	- 6.11	- 6.11		
January	1935	4.28	9.82	- 5.54	- 5.54	- 5.54	- 5.54		
February		12.56	4.54	+ 8.02	+ 8.02	+ 8.02	+ 8.02	+ 8.02	
March		3.99	4.68	- .69	- .69	- .69	- .69	- .69	- .69
April		1.82	5.48	- 3.66	- 3.66	- 3.66	- 3.66	- 3.66	- 3.66
May		12.07	13.24	- 1.17	- 1.17	- 1.17	- 1.17	- 1.17	- 1.17
June		20.21	14.48	+ 5.73	+ 5.73	+ 5.73	+ 5.73	+ 5.73	+ 5.73
July		10.03	11.77	- 1.74	- 1.74	- 1.74	- 1.74	- 1.74	- 1.74
August		8.94	7.91	+ 1.03	+ 1.03	+ 1.03	+ 1.03	+ 1.03	+ 1.03
September		3.88	3.37	+ .51	+ .51	+ .51	+ .51	+ .51	+ .51
October		6.80	4.72	-16.80	+ 2.08	+ 2.08	+ 2.08	+ 2.08	+ 2.08
November		4.57	7.46		+ 2.77	- 3.26	- 1.54	- 2.89	- 2.89
December		6.28	13.46					- 7.18	- 7.18
January	1936	8.45	9.82					- 1.37	- 1.37
February		3.29	4.54					- 1.25	- 1.25
March		11.48	4.68					+ 6.80	-10.60
								+ 4.22	

APPENDIX II.

(*a*) Soils of Variety Trial Sites.

Plantation :—	Sophia Sugar Experiment Station.													
Field No. :—	1 E.		3 E. A,B.		5 E. A,B,C,D,E.		12 E.		1 W.		5 W.		6 W. A,B.	
Sample No. :—	D. 652	D. 653	D. 900	D. 901	D. 1098	D. 1099	D. 883	D. 884	D. 794	D. 795	D. 1112	D. 1113	D. 896	D. 897
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	5.99	6.07	5.73	6.54	5.70	6.78	6.44	6.99	5.79	6.84	6.44	7.39	6.44	7.71
Exchange pH	5.36	5.42	4.49	5.45	4.49	5.81	5.41	5.91	4.41	5.54	5.17	6.24	5.23	6.57
M.P.S.	44.7	45.2	44.1	49.2	48.3	52.9	45.9	44.8	50.1	54.5	47.3	52.6	49.6	51.3
% Sand	2.3	2.6	2.5	1.7	2.0	2.0	5.0	1.0	2.4	2.9	4.9	4.0	2.4	1.2
Index of Texture	44	45	44	49	48	53	45	44	50	54	46	52	49	51
% Soluble Salts	0.289	0.439	0.066	0.220	0.086	0.279	0.038	0.129	0.041	0.055	0.058	0.154	0.064	0.121
% Organic Matter	1.48	1.19	1.77	0.75	1.73	0.73	1.61	0.99	1.51	0.82	1.70	0.88	1.55	0.87
% Nitrogen	0.124	0.063	0.156	0.096	0.132	0.091	0.139	0.111	0.133	0.097	0.119	0.084	0.126	0.104
Carbon/Nitrogen ratio	6.93	10.98	6.57	4.56	8.10	27.62	6.73	5.20	6.58	1.93	8.27	6.25	7.16	4.88
Rate of Solution	28	41	23	3	43	–24	131	69	4	250	210	60	187	95
Lime requirement, Ton/acre $CaCO_3$	1.7	1.4	3.87	1.71	3.6	0.9	2.98	1.55	4.5	1.6	2.8	0.6	2.69	0.38

Appendix II (*Contd.*).

(*a*) Soils of Variety Trial Sites.

Plantation :-	Sophia Sugar Experiment Station.													
Field No. :—	7 W.		8 W.		9 W.		10 W.		12 W.		13 W.		16 W.	
Sample No. :—	D. 1114	D. 1115	D. 1116	D. 1117	D. 1068	D. 1069	D. 1066	D. 1067	D. 1064	D. 1065	D. 898	D. 899	D. 784	D. 785
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	6.55	7.99	7.13	7.83	6.31	7.22	5.77	6.69	5.87	6.85	5.74	7.07	6.15	7.98
Exchange pH	5.20	6.75	6.19	6.75	5.40	6.45	4.99	6.11	4.64	6.01	4.51	5.89	4.75	6.36
M.P.S.	44.5	50.5	43.9	50.0	43.7	43.5	43.1	43.4	45.5	46.5	49.8	54.7	43.1	45.6
% Sand	7.0	8.0	8.0	7.5	3.2	2.9	4.0	5.7	3.5	3.7	3.0	3.2	15.8	16.0
Index of Texture	43	49	42	49	43	43	42	42	45	46	49	54	40	43
Soluble Salts	0.047	0.139	0.084	0.159	0.084	0.139	0.082	0.219	0.066	0.115	0.056	0.141	0.044	0.077
Organic Matter	1.76	0.75	1.46	0.76	1.35	0.77	1.38	0.71	1.38	0.77	1.60	0.66	1.05	0.50
Nitrogen	0.126	0.081	0.126	0.063	0.108	0.088	0.114	0.088	0.128	0.093	0.127	0.090	0.105	0.072
Carbon/Nitrogen ratio	8.12	5.36	6.71	6.98	7.26	5.09	7.00	4.67	6.27	4.80	7.34	4.29	5.80	4.00
Rate of Solution	217	106	232	95	123	66	32	65	41	77	78	34	170	83
Lime requirement, Ton/acre $CaCO_3$	2.5	...	1.0	...	2.4	0.8	2.4	0.7	3.8	0.9	4.31	1.42	2.5	0.2

APPENDIX II (*Contd.*).

(*a*) SOILS OF VARIETY TRIAL SITES.

Plantation :—	PORT MOURANT.						BLAIRMONT.						CANE GROVE.	
Field No. :—	28 A.E.		15 A.O.L.		11 T.L.		4 Hp.		24 Rp.		18 R.		17 P.	
Sample No. :—	B. 116	B. 117	B. 139	B. 140	B. 261	B. 262	B. 98	B. 99	B. 282	B. 283	B. 48	B 49	D. 1084	D. 1085
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	5.90	6.59	6.01	6.01	5.18	5.34	4.95	5.44	5.15	5.40	4.81	4.62	4.46	4.87
Exchange pH	4.78	5.34	4.97	5.27	4.12	4.38	3.78	4.01	4.17	4.54	3.58	3.58	3.82	3.89
M.P.S.	45.1	43.7	48.3	50.3	53.7	53.7	56.1	50.1	49.5	46.3	42.7	48.7	61.9	54.2
% Sand	3.8	2.7	5.5	5.0	5.5	1.7	7.7	2.6	6.0	3.5	10.2	7.8	7.3	4.0
Index of Texture	44	43	47	49	53	53	55	50	48	46	41	47	61	53
% Soluble Salts	0.045	0.081	0.051	0.161	0.077	0.124	0.028	0.033	0.046	0.077	0.027	0.034	0.017	0.019
% Organic Matter	1.86	1.19	2.23	1.22	3.28	1.60	6.11	1.69	4.94	2.83	1.73	1.46	7.83	3.10
% Nitrogen	0.141	0.110	0.177	0.120	0.243	0.141	0.337	0.128	0.323	0.159	0.134	0.120	0.471	0.207
Carbon/Nitrogen ratio	7.64	6.28	7.31	5.89	7.83	6.58	10.52	7.65	9.05	10.30	7.52	7.07	9.64	11.14
Rate of Solution	121	31	57	47	39	7	24	11	6	20	34	17	6	16
Lime Requirement, Ton/acre $CaCO_3$	2.78	1.37	4.3	2.58	7.1	4.1	9.11	4.11	7.8	4.6	10.7	12.4	19.3	14.2

Appendix II (*Contd.*).

(*a*) Soils of Variety Trial Sites.

Plantation :—	Enmore.		Lusignan.		La Bonne Intention.		Ogle.		Diamond.		Wales.			
Field No. :—	15 B.A.		40 W.		36 L.R.		61 O.		90 G.D.		4 B.		45 B.	
Sample No. :—	D. 1080	D. 1081	D. 1056	D. 1057	D. 1078	D. 1079	D. 672	D. 673	D. 662	D. 663	D. 771	D. 772	D. 1082	D. 1083
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	4.56	4.68	4.75	4.78	5.34	5.91	5.24	5.06	4.70	4.31	4.87	4.68	4.41	4.46
Exchange pH	3.70	3.69	3.63	3.87	4.19	5.25	3.89	4.00	3.96	3.74	4.16	4.18	3.79	3.75
M.P.S.	51.7	52.0	42.8	51.3	42.5	45.0	38.1	47.2	57.8	59.0	53.3	55.2	56.3	50.8
% Sand	8.3	11.1	13.0	3.7	2.5	1.7	10.0	6.1	4.7	3.5	6.9	4.2	4.5	2.6
Index of Texture	50	50	40	51	42	45	36	46	57	58	52	54	55	50
% Soluble Salts	0.022	0.027	0.028	0.104	0.051	0.202	0.032	0.099	0.030	0.049	0.011	0.014	0.025	0.018
% Organic Matter	3.75	2.07	2.55	1.17	1.89	0.86	1.73	1.13	5.31	7.28	3.09	3.01	6.92	5.40
% Nitrogen	0.226	0.133	0.150	0.105	0.156	0.091	0.108	0.097	0.230	0.234	0.204	0.189	0.271	0.153
Carbon/Nitrogen ratio	9.64	9.05	9.84	6.46	7.03	5.46	9.28	6.73	13.40	18.05	8.77	9.23	14.81	20.47
Rate of Solution	6	18	5	-3	103	61	394	13	68	47	18	5	2	6
Lime Requirement Ton/acre $CaCO_3$	17.6	15.6	9.7	8.0	5.7	2.4	5.84	4.91	13.4	15.0	14.33	14.60	16.8	14.2

APPENDIX II (*Contd.*).

(*a*) SOILS OF VARIETY TRIAL SITES.

Plantation :—	UITVLUGT.			
Field No. :—	13 E.		42 W.	
Sample No. :—	D. 674	D. 675	D. 1058	D. 1059
Sampling Depth :—	0—1 ft.	1—2 ft.	0—1 ft.	1—2 ft.
Normal pH	4.80	5.12	4.85	5.05
Exchange pH	3.86	4.24	4.11	3.99
M.P.S.	47.4	48.1	54.7	49.7
% Sand	6.3	4.8	6.2	1.5
Index of Texture	46	47	54	49
% Soluble Salts	0.057	0.161	0.023	0.012
% Organic Matter	1.12	0.98	6.34	1.60
% Nitrogen	0.111	0.104	0.277	0.140
Carbon/Nitrogen ratio	5.85	5.48	13.26	6.65
Rate of Solution	8	36	6	–4
Lime Requirement Ton/acre $CaCO_3$	6.08	3.33	13.7	10.0
Available P_2O_5 p.p.m. (Truog)	...	...	...	...
Citric P_2O_5 p.p.m.	...	...	...	...
Exch. and water sol. bases mg. eqs./100 gms.				
Lime	...	...	...	...
Magnesia	...	...	...	...
Potash	...	...	...	...
Soda	...	...	...	...

(*b*) SOILS OF MANURIAL TRIAL SITES.

Plantation :—	UITVLUGT.								
Field No. :—	94 Met-en-meerzorg.		90 Met-en-meerzorg.		14 Zeeburg.		72 De Kinderen.		
Sample No. :—	D. 702	D. 703	U.T. 181	U.T. 182	D. 751	D. 752	D.K. 85	D.K. 86	
Sampling Depth :—									
Normal pH	4.88	4.66	5.18	4.60	5.62	5.79	3.89	3.95	
Exchange pH	3.88	3.41	3.75	3.61	4.25	4.36	3.24	3.24	
M.P.S.	65.7	59.6	62.4	53.7	44.0	45.8	72.3	58.7	
% Sand	4.1	2.7	5.2	2.5	4.8	2.3	8.1	2.3	
Index of Texture	65	59	61	53	43	45	72	58	
% Soluble Salts	0.029	0.036	0.017	0.032	0.023	0.048	0.079	0.039	
% Organic Matter	5.87	5.19	10.88	2.75	0.98	0.64	26.42	7.94	
% Nitrogen	0.845	0.148	0.337	0.124	0.104	0.076	0.501	0.190	
Carbon/Nitrogen ratio	18.4	20.3	18.72	12.89	5.11	4.89	30.7	24.3	
Rate of Solution	–7	24	3	–11	21	18	–25	149	
Lime Requirement Ton/acre $CaCO_3$	12.72	16.28	18.7	13.8	6.96	3.93	27.4	21.4	
Available P_2O_5 p.p.m. (Truog)	30	53	55	10	30	22	30	nil	
Citric P_2O_5 p.p.m.	208	75	211	22	66	48	123	11	
Exch. and water sol. bases mg. eqs./100 gms.									
Lime	1.80	1.32	2.30	1.65	4.40	4.50	2.34	1.15	
Magnesia	0.80	0.64	1.16	3.06	7.85	12.65	1.34	2.08	
Potash	0.13	0.24	0.05	0.14	0.24	0.19	0.23	0.08	
Soda	0.05	0.12	0.05	0.28	0.45	1.29	0.11	0.40	

Appendix II (*Contd.*).

(*b*) Soils of Manurial Trial Sites.

Plantation :—	Skeldon.						Port Mourant.				Albion.		Rose Hall.	
Field No. :—	7 Eliza and Mary.		8 Eliza and Mary.		8 Springlands.		13 Resource.		4 House End.		31 Kilcoy.		30 Rose Hall	
Sample No. :—	B. 263	B. 264	B. 266	B. 265	B. 267	B. 268	B. 210	B. 211	B. 104	B. 105	B. 255	B. 256	B. 108	B. 109
Normal pH	4.55	4.73	4.92	4.95	5.52	4.73	4.97	4.97	6.21	6.63	6.17	6.14	5.77	6.09
Exchange pH	3.86	4.06	3.96	4.26	5.07	4.28	4.05	4.24	4.82	5.55	5.27	5.52	4.80	5.08
M.P.S.	50.1	54.2	52.0	52.3	50.3	53.5	51.4	52.7	49.8	54.7	52.5	54.7	50.4	51.7
% Sand	6.0	4.7	7.7	5.7	5.2	7.5	3.7	2.4	1.2	0.9	3.9	1.5	3.7	2.6
Index of Texture	49	53	51	51	49	52	51	52	50	55	52	54	50	51
% Soluble Salts	0.135	0.265	0.064	0.165	0.371	0.349	0.061	0.154	0.045	0.131	0.070	0.204	0.048	0.143
Organic Matter	3.05	1.67	2.81	2.62	1.10	2.07	2.74	1.23	2.30	0.98	2.95	1.65	2.00	1.36
Nitrogen	0.251	0.156	0.237	0.219	0.135	0.226	0.199	0.140	0.173	0.092	0.230	0.143	0.157	0.109
Carbon/Nitrogen ratio	7.04	6.20	6.86	6.64	4.71	5.33	7.99	5.09	7.72	5.89	7.43	6.70	7.40	7.25
Rate of Solution	–2	–43	–117	–189	–54	–47	16	–4	107	35	151	51	306	–2
Lime Requirement, Ton/acre $CaCO_3$	8.0	5.0	7.1	5.3	2.5	5.2	11.2	5.0	3.57	1.01	4.0	2.1	3.36	1.73
Available P_2O_5 p.p.m. (Truog)	14	<10	<10	<10	<10	<10	18	21	nil	50	18	40	16	24
Citric P_2O_5 p.p.m.	33	12	42	21	8	18	75	23	44	28	41	32	44	26
Exch. and water sol. bases mg. eqs./100 gms.														
Lime	4.15	3.35	5.60	4.62	2.47	6.33	6.02	5.55	8.20	7.00	10.56	8.24	10.40	12.00
Magnesia	9.02	12.20	5.95	11.58	8.95	16.48	9.83	12.69	14.20	16.25	12.72	16.67	12.30	15.95
Potash	0.27	0.24	0.43	0.31	0.33	0.29	0.34	0.31	0.36	0.27	0.34	0.34	0.14	0.23
Soda	0.70	2.97	0.73	0.72	3.25	0.80	1.19	1.89	1.13	1.72	1.18	2.58	0.15	0.72

APPENDIX II.—(*Contd.*).

(*b*) SOILS OF MANURIAL TRIAL SITES.

Plantation :—	ROSE HALL.		BLAIRMONT.		CANE GROVE.				ENMORE.				LUSIGNAN.	
Field No. :—	20 Tappinsburg.		71 Bush Lot.		53 Melville.		63 Melville.		8 Bachelor's Adventure.		16 East Paradise.		85 Mon Repos.	
Sample No. :—	B. 212	B. 213	B. 224	B. 225	D. 910	D. 911	D. 904	D. 905	D. 716	D. 717	D. 964	D. 965	D. 1088	D. 1089
Normal pH	5.20	5.25	5.34	5.42	4.70	4.92	4.83	3.28	5.28	5.22	4.77	4.65	4.97	4.94
Exchange pH	4.10	4.37	3.92	4.63	3.69	3.72	3.86	3.02	4.21	4.09	3.52	3.60	3.75	4.09
M.P.S.	50.8	52.7	50.7	48.4	46.9	47.6	52.7	57.2	48.4	50.3	51.9	54.0	50.5	51.1
% Sand	1.4	5.1	8.9	3.7	2.7	3.7	5.0	4.5	2.7	2.0	2.5	2.0	9.5	3.0
Index of Texture	50	52	49	48	49	47	52	56	48	50	51	54	49	51
% Soluble Salts	0.039	0.060	0.036	0.137	0.020	0.018	0.033	0.339	0.098	0.183	0.036	0.070	0.009	0.058
% Organic Matter	2.10	1.74	2.70	1.21	4.15	1.89	7.18	12.9	2.16	1.29	2.73	1.74	2.39	1.84
% Nitrogen	0.168	0.156	0.241	0.129	0.189	0.147	0.348	0.285	0.155	0.102	0.204	0.150	0.154	0.116
Carbon/Nitrogen ratio	7.24	6.46	6.40	5.44	12.8	7.45	12.0	24.4	8.19	7.34	7.78	6.76	9.00	9.20
Rate of Solution	45	54	137	42	2	12	12	40	170	55	51	14	4	18
Lime Requirement, Tons/acre $CaCO_3$	6.0	4.0	8.5	3.4	15.7	13.0	15.0	14.4	5.45	3.69	13.3	12.6	11.0	6.7
Available P_2O_5 p.p.m. (Truog)	18	20	26	19	10	10	10	10	52	30	11	10	10	Trace
Citric P_2O_5 p.p.m.	31	23	116	22	26	8	38	11	208	56	92	36	0.0088	0.0022
Exch. and water sol. bases mg. eqs./100 gms.														
Lime	5.40	4.41	6.60	4.62	3.90	3.65	3.57	3.73	7.79	5.10	6.00	5.10	4.15	4.86
Magnesia	11.53	10.84	4.87	13.50	2.93	7.35	2.86	5.93	4.06	12.60	7.41	9.83	6.20	12.53
Potash	0.38	0.31	0.57	0.23	0.41	0.32	0.39	0.18	0.47	0.39	0.51	0.38	0.25	0.89
Soda	0.90	1.12	1.42	3.07	0.27	0.52	0.46	0.60	1.24	3.71	0.64	1.21	0.97	0.28

Appendix (*Contd.*).

(*b*) Soils of Manurial Trial Sites.

Plantation :—	Lusignan.				Ogle.		Wales.		Versailles.		Leonora.		Uitvlugt.	
Field No. :—	26 West.		4 Empolder.		45 Ogle.		9 Cottage.		31 R.D.Z.		N.E.A.C.I.		33 East.	
Sample No. :—	D. 1018	D. 1019	D. 706	D. 707	D. 1020	D. 1021	D. 890	D. 891	D. 753	D. 754	D. 1022	D. 1023	D. 888	D. 889
Normal pH	5.97	6.21	5.00	4.85	4.98	5.07	4.59	4.72	4.95	4.87	4.87	4.61	4.70	4.63
Exchange pH	4.90	5.29	3.57	3.77	3.62	3.84	4.06	4.02	4.03	4.04	3.83	3.63	4.16	3.96
M.P.S.	45.6	47.2	59.3	59.3	47.6	50.4	64.9	56.8	51.4	51.2	60.7	54.6	55.0	51.1
% Sand	1.7	2.7	2.8	2.1	7.7	2.5	6.6	5.7	5.4	8.5	3.9	1.9	7.6	2.1
Index of Texture	45	47	59	59	46	50	64	56	50	50	60	54	54	51
% Soluble Salts	0.046	0.166	0.021	0.032	0.038	0.107	0.041	0.040	0.015	0.014	0.027	0.020	0.035	0.026
% Organic Matter	1.56	0.97	3.80	2.55	1.94	1.15	6.93	3.06	4.44	3.37	3.40	2.26	4.09	1.47
% Nitrogen	0.140	0.100	0.263	0.169	0.143	0.116	0.350	0.266	0.272	0.240	0.229	0.133	0.254	0.137
Carbon/Nitrogen ratio	6.48	5.64	8.39	8.74	7.85	5.75	11.5	6.65	9.46	8.14	16.20	9.88	9.32	6.24
Rate of Solution	43	51	-6	-10	16	2	-6	-7	-1	-9	-16	-12	4	5
Lime Requirement, Ton/acre $CaCO_3$	3.0	1.8	14.78	9.83	9.0	6.6	17.4	13.1	20.28	19.56	16.2	14.4	12.1	11.8
Available P_2O_5 p.p.m. (Truog)	29	25	15	15	28	16	38	20	32	22	20	10	47	22
Citric P_2O_5 p.p.m.	91	28	139	71	133	46	167	67	133	100	111	107	121	33
Exch. and water sol. bases mg. eqs./100 gms.														
Lime	10.47	6.20	5.56	5.36	5.44	5.02	2.74	1.55	1.20	1.50	2.75	1.37	3.40	1.55
Magnesia	12.06	16.40	0.04	0.09	14.26	11.77	4.35	3.67	0.30	0.45	1.68	2.05	0.68	0.87
Potash	0.50	0.27	0.42	0.31	0.60	0.27	0.18	0.16	0.06	0.07	0.20	0.18	0.25	0.12
Soda	1.33	3.28	0.29	0.60	0.90	2.86	0.15	0.11	0.00	0.00	0.07	0.14	0.17	0.11

APPENDIX II (*Contd.*).

(*c*) SOILS OF FLOOD-FALLOW TRIAL SITES.

Plantation :—	PORT MOURANT.			
Field No. :—	28 Tain Windward.		28 Tain Leeward.	
Sample No. :—	B. 100	B. 101	B. 102	B. 103
Normal pH	5.79	6.56	5.92	6.29
Exchange pH	4.73	5.52	4.73	5.42
M.P.S.	50.6	52.0	51.1	56.0
% Sand	2.5	2.1	3.2	1.3
Index of Texture	50	52	50	56
% Soluble Salts	0.089	0.224	0.095	0.243
% Organic Matter	2.46	1.01	2.71	1.04
% Nitrogen	0.178	0.101	0.169	0.095
Carbon/Nitrogen ratio	8.017	5.792	9.315	6.348
Rate of Solution	58	11	12	43
Lime Requirement, Ton/acre $CaCO_3$	3.51	1.46	3.49	1.39

APPENDIX III.

CALENDAR OF AGRICULTURAL OPERATIONS ON MANURIAL TRIAL AREAS.

Experiment No.	Page of Bulletin.	Estate.	Field.	Variety.	System of Replication.	Size of Plots Acres.	DATE OF							
							Planting.	Applying Limestone and/or Slaked Lime.	Applying Potash.	Applying Phosphate.	Applying Sulphate of Ammonia.	Applying Cyanamide.	Flooding Field.	Reaping.
	61	Port Mourant	4 H.E.	D. 625	A four by four Latin Square	0.051	23.XII.32	17.XII.32[1, 4]	—	26.I.33[1, 4]	26.I.33[1] 24.III.34[2] 16.IV.35[3]	—	19.II.32 to 30.XI.32	23.II.34[1] 13.III.35[2] 24.I.36[3]
C 1	92	„	13 R.	D. 625	A five by five Latin Square	0.051	6.I.34	26.I.34[1]	—	27.II.34[1] 28.III.35[2]	—	—	21.IV.33 to 23.XII.33	14.III.35[1] 27.II.36[2]
B 1	89	Blairmont	71 B.L.	D. 625	A five by five Latin Square	0.051	4.VIII.34	10.VIII.34	—	—	—	—	—	10.X.35[1]
A 2	62	Rose Hall	30 R.H.	D. 625	A four by four Latin Square	0.048	27.I.33	2.II.33[1, 4]	13.IV.33[1, 4] 26.III.35	13.IV.33[1, 4]	2.III.33[1] 24.III.34[2] 26.III.35[3]		For 4½ months previous to planting	7.III.34[1] 5.III.35[2] 25.II.36[3]
C 2	92	„	20 T.	D. 625	A five by five Latin Square	0.051	27.III.34	5.V.34[1]	—	6.IV.34[1] 26.III.35[2]	—	—	9.IX.33 to 27.II.34	12.III.35[1] 26.II.36[2]
A 11	60	Lusignan	4 Emp.	D. 625	A five by five Latin Square	0.051	18.XII.32	9.I.33[1, 4]	—	—	9.II.33[1] 10.IV.34[2] 15.II.35[3]	—	October 1931 to November 1932	27.II.34[1] 12.II.35[2] 20.II.36[3]
A 17	75	„	26 W.	P.O.J. 2878	Three four by four Latin Squares	0.034	1933	—	—	—	25.IX.34[2]	—	—	11.IX.34[1] 21.VIII.35[2]
A 5	62	„	85 M.R.	D. 625	A four by four Latin Square	0.042	1933	—	—	—	24.IV.35[2]	—	—	1934[1] 27.IV.35[2] 31.III.36[3]

[1] Plants. [2] First Ratoons. [3] Second Ratoons. [4] Basic Application.

APPENDIX III (*Contd.*).

CALENDAR OF AGRICULTURAL OPERATIONS ON MANURIAL TRIAL AREAS.

Experiment No.	Page of Bulletin.	Estate.	Field.	Variety.	System of Replication.	Size of Plots, Acres.	DATE OF							
							Planting.	Applying Limestone and/or Slaked Lime.	Applying Potash.	Applying Phosphate.	Applying Sulphate of Ammonia.	Applying Cyanamide.	Flooding Field.	Reaping.
A 18	79	Skeldon	7 E.M.	Diamond 10	Three four by four Latin Squares	0.034	1933	—	—	—	12.X.34[2]	—	—	4.X.34[1] 2.X.35[2]
A 16	75	„	8 E.M.	P.O.J. 2878	Three four by four Latin Squares	0.034	193	—	—	—	12.X.34[2]	—	—	4.X.34[1] 1.X.35[2]
A 14	72	„	8 Sp.	P.O.J. 2878	Three four by four Latin Squares	0.027	8.IX.34	—	—	—	13.X.34[1]	—	—	3.X.35[1]
B 5	89	Albion	31 K.	D. 625	A five by five Latin Square	0.041	31.VIII.34	5.IX.34[1]	—	—	—	—	For 10 months previous to planting	17.IX.35[1]
A 15	73	Ogle	45 O.	P.O.J. 2878	Three four by four Latin Squares	0.041	28.VII.34	—	—	—	2.X.34[1]	—	—	23.X.35[1]
A 20	83	Wales	9 C.	Diamond 10	A five by five Latin Square	0.051	24.II.34	28.II.34[1, 4]	18.V.34[1, 4] 26.III.35[2, 4]	—	18.V.34[1] 26.III.35[2]	—	June 1933 to January 1934	16.III.35[1] 4.III.36[2]
A 13	70	Versailles	31 R.D.Z.	D. 625	A five by five Latin Square	0.051	14.II.33	7.III.33[1, 4]	12.V.33[1, 4] 10.IV.35[3, 4]	—	12.V.33[1] 28.IV.34[2, 4] 22.VI.34[2] 10.IV.35[3]	—	Unflooded Pegasse	15.III.34[1] 13.III.35[2] 10.III.36[3]
A 23 B 3	85 87	Leonora	N.E.A. C.I.	Diamond 10	A five by five Latin Square	0.042	19.X.34	23.X.34[1]	—	—	7.XII.34[1]	23.X.34[1]	—	31.I.36[1]
A 22 B 2	85 87	Uitvlugt	72 DeK.	Diamond 10	A five by five Latin Square	0.049	3.XI.34	7.XI.34[1]	—	—	20.XII.34[1]	7.XI.34[1]	—	13.XI.35[1]

[1] Plants. [2] First Ratoons. [3] Second Ratoons. [4] Basic Application.

Appendix III (*Contd.*).

Calendar of Agricultural Operations on Manurial Trials Areas.

Experiment No.	Page of Bulletin.	Estate.	Field.	Variety.	System of Replication.	Size of Plots. Acres.	Date of							
							Planting.	Applying Limestone and/or Slaked Lime.	Applying Potash.	Applying Phosphate.	Applying Sulphate of Ammonia.	Applying Cyanamide.	Flooding Field.	Reaping.
A 3	62	Enmore	8 B.A.	D. 625	A four by four Latin Square	0.051	2.XII.32	2.XII.32[1, 4]	—	—	10.I.33[1] 29.III.34[2] 14.III.35[3]	—	26.III.32 to 21.XI.32	23.II.34[1] 12.II.35[2] 3.III.36[3]
B 6	89	„	16 E.P.	Diamond 10	A five by five Latin Square	0.051	28.VII.34	31.VII.34[1]	—	—	—	—	For one year previous to planting	2.X.35[1]
C 3	92	Cane Grove	53 M.	P.O.J. 2878	A five by five Latin Square	0.051	14.IV.34	—	—	15.VI.34[1] 19.VI.35[2]	—	—	—	21.V.35[1] 9.IV.36[2]
A 10	67	„	63 M.	D. 625	A five by five Latin Square	0.054	31.III.34	11.V.34[1, 4]	—	11.V.34[1, 4]	15.VI.34[1] 19.VI.35[2]	—	—	3.V.35[1] 2.IV.36[2]
A 12	70	Uitvlugt	94 M.Z.	D. 625	A five by five Latin Square	0.051	5.XI.32	10.XI.32[1, 4]	20.XII.32[1, 4] 8.III.34[2, 4] 25.III.35[3, 4]	—	20.XII.32[1] 19.II.34[2] 19.XII.34[3]	—	10.V.32 to 2.X.32	28.XI.33[1] 16.XI.34[2] 17.X.35[3]
A 21 B 1	85 87	„	90 M.Z.	Diamond 10	A five by five Latin Square	0.042	18.VIII.34	7.IX.34[1]	24.X.34[1, 4]	—	24.X.34[1]	7.IX.34[1]	—	18.X.35[1]
A 19	81	„	33 E.	P.O.J. 2878	A five by five Latin Square	0.042	20.II.34	15.V.34[1, 4]	21.VI.34[1, 4]	—	21.VI.34[1]	—	—	11.IX.35[1]
A 4	62	„	14 Z.	D. 625	A four by four Latin Square	0.041	25.II.33	1.III.33[1, 4]	13.IV.33[1, 4] 21.VI.34[2, 4] 25.III.35[3, 4]	13.IV.33[1, 4]	13.IV.33[1] 24.V.34[2, 4] 21.VI.34[2] 25.III.35[3]	—	For 5 months previous to planting	9.III.34[1] 5.III.35[2] 21.II.36[3]

[1] Plants. [2] First Ratoons. [3] Second Ratoons. [4] Basic Application.